MEDICAL LIBRARY

BULLETIN of the INSTITUTE of the HISTORY OF MEDICINE

THE JOHNS HOPKINS UNIVERSITY

Editor—HENRY E. SIGERIST

VOLUME III JULY, 1935 NUMBER 7

CONTENTS

Old Hopkins Pictures No. 7: Dr. William H. Welch in China in 1915 ..... Frontispiece

A Physician of Two Centuries Ago. Richard Mead and His Contributions to Epidemiology: C.-E. A. WINSLOW 509

The Position of Maimonides in the History of Philosophy: SAMUEL ROSENBLATT 545

Moses Maimonides the Physician: HARRY FRIEDENWALD ... 555

Moses Maimonides, Physician and Scientist. The William Osler of Mediaeval Arabic and Hebrew Medicine: DAVID I. MACHT 585

TEXTS AND DOCUMENTS

Περὶ Γυναικείων α΄ of the Corpus Hippocraticum in a Mediaeval Translation (Cod. Leninopolitanus Lat. F. v. VI. 3, fol. 9): GEORGE WALTER 599

NOTES AND COMMENTS

The Correspondence of Max von Pettenkofer: HENRY E. SIGERIST 607

MEDICO-HISTORICAL ACTIVITIES IN THE UNITED STATES

Baltimore, Maryland 610

Charleston, South Carolina 611

THE JOHNS HOPKINS PRESS

BALTIMORE, MARYLAND

BULLETIN of the INSTITUTE of the HISTORY OF MEDICINE

THE JOHNS HOPKINS UNIVERSITY

Editor—HENRY E. SIGERIST

Correspondence relating to the publication of papers should be addressed to The Editor, Bulletin of the Institute of the History of Medicine, 1900 East Monument Street, Baltimore, Maryland, U. S. A.

Twenty-five reprints without covers will be furnished to contributors free of cost. An order slip for additional reprints, giving the cost, is sent with the galley proof to each contributor and must be returned immediately to the Editor.

Correspondence pertaining to business affairs should be sent to the publishers, The Johns Hopkins Press, Baltimore, Maryland, U. S. A.

The journal is published monthly, except August and September. The volume will comprise about 500 pages.

Subscription is $5.00 a year in the United States and its possessions. In Canada $5.25 a year; in foreign countries $5.50 a year. Single numbers, when available, will be 75 cents each.

This journal will not publish book reviews.

Subscriptions may be entered at any time. However, if feasible and so desired by a subscriber, subscription may begin with the January number.

THE JOHNS HOPKINS PRESS

BALTIMORE, MARYLAND, U. S. A.

PUBLISHED TEN TIMES A YEAR

Made in United States of America

Entered as second-class matter January 3, 1935, at the post office at Baltimore, Maryland, under the Act of March 3, 1879.

Dr. William H. Welch in China in 1915

BULLETIN OF THE INSTITUTE OF THE HISTORY OF MEDICINE

THE JOHNS HOPKINS UNIVERSITY

Editor—HENRY E. SIGERIST

VOLUME III JULY, 1935 NUMBER 7

A PHYSICIAN OF TWO CENTURIES AGO: RICHARD MEAD AND HIS CONTRIBUTIONS TO EPIDEMIOLOGY *

C.-E. A. WINSLOW

Professor of Public Health, Yale School of Medicine

The world of two hundred years ago was a pleasant place for the more fortunate classes of society. It was what Wells has called the period of the Grand and Parliamentary Monarchies, with George II of England, Louis XV of France and Frederick I of Prussia among its prominent figures. The last quarter of the Seventeenth and the first quarter of the Eighteenth Century had been periods of many wars, yet these wars did little to disrupt the course of economic and social life. Leeuwenhoek continued to despatch his communications to the Royal Society of London in complete indifference to the fact that England and Holland were at war. Economic conditions were on the whole favorable, even for the lower classes. The world of thought was permeated by a placid optimism which had its parallel in the later Victorian age of our own youth. Gibbon, a little later, wrote, " Since the first discovery of the arts, war, commerce, and religious zeal have diffused, among the savages of the Old and New World, those inestimable gifts, they have been successively propagated; they can never be lost. We may therefore acquiesce in the pleasing conclusion that

* William Potter Memorial Lecture. Delivered at the Jefferson Medical College, Philadelphia, March 29, 1935.

every age of the world has increased, and still increases, the real wealth, the happiness, the knowledge, and perhaps the virtue of the human race."

In England the world seemed particularly bright. Creative intellectual effort had not been encouraged under the Commonwealth; but with the restoration of Charles II in 1660 a new era set in. In contrast to the romantic spirit of earlier English letters it was dominated by the academic influence of France where the English courtiers had lived in their exile. Gosse says, "The only guides for English verse in future were to be the pole-star of the Latin poets, and the rules of the French critics who sought to adapt Aristotle to modern life." Dryden in poetry, Otway in the drama, followed by Wycherley, and Congreve, Bentley in the classics, Evelyn and Pepys the diarists, John Locke in philosophy, Christopher Wren in architecture, and Robert Boyle and Isaac Newton in science were the leading figures of the late seventeenth century. With the accession of Queen Anne in 1702, the period reached its height, following that curious law of coincidences which has made the reigns of three English queens so brilliant. Under Anne and the first Georges, the third Earl of Shaftesbury, Alexander Pope, Addison, Steele, Swift, Defoe, Bishop Berkeley made up a galaxy surpassed only by the Elizabethans and the Victorians.

It was an intellectual world of dignity and spaciousness, of sophistication based on a sense of underlying security, of classicism and formality, of wit and humor. In this world—and of this world—was the subject of our sketch, Richard Mead. Its superficial qualities he shared; and, to them, he added a vigor of mind and an intellectual courage that were all his own.

Richard Mead was born at Stepney, August 11, 1673. (Leman says, August 2). His father Matthew Mead, was a celebrated divine ejected from Stepney Parish for nonconformity under Charles the Second. In 1683 he was forced to flee to Holland by the persecution of dissenters which was then going forward; but he later returned and continued to preach to a large congregation of nonconformists until his death in 1699.

The Meads were a good Buckinghamshire family, and the elder Mead had a handsome fortune which made possible the employ-

ment of a tutor for his thirteen children, of whom Richard Mead was the eleventh. While his father was in temporary exile, Richard was left in a nonconformist school in England. In 1689 at the age of sixteen he was sent to Utrecht, where he worked under Graevius. After three years there, he went to Leyden where he studied botany under Herman and physick under Pitcairn. He travelled in Italy and took his degree of Doctor of Philosophy and Physick at Padua in 1695, returning in the next year, 1696, to begin practice at Stepney.

In 1699 he married Ruth Marsh, by whom he had eight children, of whom four died in infancy. (It is interesting to note that two of his sons-in-law, Wilmot and Nichols, were later associtted with Mead as physicians in ordinary to the King.)

In 1720 he published his first book, a "Mechanical Account of Poisons," which included some elementary but courageous experiments on snake venom, and an abstract of which found place in Philosophical Transactions for January and February, 1703. It is significant that even in these early days men later prominent in clinical practice and in public health began their careers in the field of fundamental research.

In 1703 Mead was appointed physician in St. Thomas' Hospital and later was asked to read the anatomical lectures in the hall of the Company of Surgeons. In 1707 he was made a Doctor of Physick of Oxford and in 1716 a Fellow of the College of Physicians. He was also elected to the Royal Society of which he was a counsellor and in 1717 served as vice president.

We come now to the most important event in Mead's life. John Radcliffe had been physician to William III, and perhaps the leading physician in London. In 1714 when Radcliffe retired, shortly before his death, he turned over his practice to his young friend Mead. It was through Radcliffe's influence that Mead was summoned to the deathbed of Queen Anne in that year, and the foundation of his career was largely laid upon the prestige thus established.

It is of special interest to note that after moving into Radcliffe's house in Bloomsbury (or by a special gift before that) Mead received from Radcliffe the famous gold-headed cane, immortalized by William MacMichael, which was later to be the property of

Askew, Pitcairn and Baillie, and which now retains an honored place in the library of the Royal College of Physicians.

Of the relation between the two men Garrison says in his History of Medicine:

"Mead flattered the vanity of John Radcliffe (1650-1714) whose practice he inherited. 'Mead, I love you,' said Radcliffe, 'and I'll tell you a sure secret to make a fortune—use all mankind ill.'"

Later, he adds,

"Mead was a complete contrast to his predecessor—a scholar where Radcliffe was ignorant of books, courtly and polished where Radcliffe was crude and overbearing." There is some question however whether this is a fair statement of the facts, as other evidence does not at all indicate that Mead was a sycophant or that Radcliffe was a cynic of the type suggested.

With regard to Mead's visit to the bedside of Queen Anne, we find the following interesting passage in the "Authentic Memoirs of the Life of Richard Mead, M. D."

"As his reputation was now sufficiently established, he was called in consultation to Queen Anne, two days before her death. They who are acquainted with Courts, will easily conceive the situation of Physicians in the Antichamber, or near the bed of a dying Sovereign: their hands hold the page of fate; from their words advantages are drawn, intrigues are formed, and by their very looks men and parties foretel their own rise or fall. The wise, therefore, are the most reserved; for fear of endangering their fortune or their art, they observe the mysterious ambiguity of ancient oracles, and refer the inquisitive croud to nature, and to time. This was the conduct of her Majesty's Physicians; Dr. Mead, either more clear sighted, or more bold, no sooner saw the Queen than he declared she could not hold it out long; but finding it difficult to obtain credit, he added, out of Humanity or Prudence, that it would be sufficient to send to Hanover an account of the present symptoms, by which the Physician of that Court would immediately see, that before the account came to them the Queen would be no more."

In the year 1719 an outbreak of the plague at Marseilles was causing grave alarm (the great epidemic of 1665 being still fresh in London memory). Was this dread disease a contagion imported from abroad and to be excluded by quarantine, or was it a disease periodically generated in a given locality and beyond human control? The Lords of the Regency directed the Secretary of State to ask Mead for a report on this matter, and the document presented by him, arguing that the disease was contagious, is one of the most important classics in the history of public health, to which we shall make reference later. In pursuance of Mead's advice quarantine was ordered by act of Parliament, but was later modified in view of political opposition and of the cessation of the plague abroad so as to eliminate some of his most important recommendations.

In 1722 there was great interest in the new practice of inoculation against the smallpox and in view of its possible use for the protection of members of the royal family, Mead was asked by George I to conduct experiments on condemned criminals, which gave him a considerable share in the introduction of this practice into England. In 1723 he delivered the Harveian Oration on the place of medicine in Ancient Rome which was later attacked by Conyers Middleton. In 1724, Mead married his second wife, Anne Alston.

He was by now established as the leading medical practitioner in London. In 1726 he and Cheselden, the surgeon, were called in consultation by Sir Isaac Newton, recalling the line of Pope: "I'll try what Mead and Cheselden advise." In 1727 on the accession of George II, Mead, who had attended him as Prince of Wales, was appointed Physician to the King.

In 1747 he published an important "Treatise on Smallpox and Measles," and in 1751 there appeared his last, and what is considered by many commentators as his most important, work "Medical Rules and Admonitions."

Mead died on February 16, 1754 at the age of 81, full of years and honors.

The most important lives of Mead are as follows:

Authentic memoirs of the life of Richard Mead, M. D., J. Whis-

ton and B. White, London, 1755, expanded from the memoir in the *Journal Britannique*. By Matthew Maty (1718-1776), a native of Holland, who settled in London in 1740. He was Underlibrarian, 1753-72, and Librarian, (1772-76) of the British Museum. The "authentic memoirs" were expanded from his "Eloge" in the *Journal Britannique* for 1754. This was a French review of the productions of the English Press, issued by Maty at the Hague.

Some memoirs of the life and writings of the late Dr. Richard Mead. 8°. M. Cooper, London, 1775. By Sir Tanfield Leman, who signs the 'Advertisement.'

A delightfully picturesque chapter dealing with Mead in *The Gold Headed Cane* by William MacMichael. 8°. J. Murray, London, 1827. (Available in a modern edition published by Paul B. Hoeber, N. Y., 1926).

Also the following briefer articles:

Mattley. *Gentlemen's Mag.*, Lond., 1754, *24*, 510-515.
B. W. Richardson. *Asclepiad*, Lond., 1888, *5*, 49-79.
N. Moore. *Dict. Nat. Biog.*, Lond., 1897, *37*, 181-186.

In view of the fact that Mead's father was a dissenter who had suffered from his convictions and that his professional patron, Radcliffe, was a man of aggressive character, somewhat at odds with society, one might have expected that Mead himself would have caught something of this negativistic quality, but such was not the case. Dr. Samuel Johnson said of him, "Dr. Mead lived more in the broad sunshine of life than almost any man."

From a material standpoint he certainly had every reason to develop the psychology of success. At the height of his career he enjoyed an average income of 5000 to 6000 pounds, which had a purchasing power equivalent to approximately $100,000 today. He commonly charged a guinea as an office fee and 2 guineas or more for a home visit, and like Radcliffe he made it a practice while sitting in his coffee house (and without seeing the patients himself) to write prescriptions for half a guinea each for apothecaries who brought in verbal reports of cases.

Mead was as generous, however, as he was successful. The "Authentic Memoirs" say of him:

"During almost half a century, he was at the head of his business, which brought him in one year seven thousand pounds and upwards, and for several years between five and six thousand pounds. His generous and benevolent Temper was constantly exercised in acts of charity. Clergymen, and in general all men of learning, were welcome to his advice, and his doors were always open every morning to the most indigent, whom he frequently assisted with his purse; so that notwithstanding his great gains he did not dye very rich, being persuaded, that what he got from the public could never be bestowed more honourably, than in the advancement of Science, and the encouragement of the Learned."

He was not only generous himself but the cause of generosity in others, since he is believed to have been largely responsible for persuading Guy to build the hospital which has immortalized his name.

Mead's relationship to John Freind (1675-1728) is an excellent illustration of his loyalty to his friends. Mead and Freind had been associated in a controversy with regard to the value of purgatives in smallpox, a controversy so bitter as to lead to an inconclusive duel between Mead and John Woodward in the quadrangle of Gresham College. In 1723, Freind got into political trouble and was incarcerated in the Tower on a charge of high treason. Mead himself, of course, was of the Government party, but he espoused his friend's cause with vigor and discretion and by intervention with Sir Robert Walpole, who was one of Mead's patients, secured Freind's freedom. The story goes that he presented his friend with 5000 guineas which he had collected from Freind's patients upon whom Mead had attended during the period of the imprisonment.

Mead enjoyed a remarkable reputation as a scholar and a patron of the arts. His library where his principal collections were housed was sixty feet long, and his house in Great Ormond Street is described as "a temple of nature and a repository of time."

In the "Authentic Memoirs" we read:

"Nothing did more honor to this Patron of Learning than the free and constant access of men of different qualifications to his table, who were each employed the rest of the day, at his particular work or study. There no man's talents were misplaced, none was honoured with an undue preference: the Scholar took his place near the Naturalist, and the Mathematician near the Antiquarian or the Painter. Every one found himself surrounded with objects capable of instructing him, or exciting his emulation. Our Maecenas was frequently the only man in company, who was acquainted with all their different languages, and was able to perform the office of an interpreter to them all: he constantly questioned them in a most obliging manner, about their different occupations, taking great pleasure in commending their several performances and discoveries, and by this means, inspired them all with emulation and a reciprocal esteem for each other.

"No foreigner of any learning, taste, or even curiosity, ever came to London without being introduced to Dr. Mead; it would have been a shame to return home without having seen him. On these occasions, his table was always open, and united the Magnificence of Princes with the Pleasures of Philosophers."

Mead was a friend of Pope, Halley and Newton as well as of Garth, Arbuthnot and the leading physicians of his time. He carried on a constant correspondence with Boerhaave, who had been a fellow student at Leyden. He represented to perfection the highest aims of the medicine of his day which visualized the physician as, above all, a cultivated gentleman.

MacMichael has a passage in one of his imaginary discussions in which he makes Mead express this ideal as follows:

"What class of men have deserved better of the public than physicians? How much, for instance, does not this country owe to Linacre, the founder of our College? He was perhaps the most learned man of his time, and on his travels was received by Lorenzo de Medici with the most marked distinction. That munificent patron of literature granted him the privilege of attending the same preceptors with his own sons, and Linacre improved the opportunities he enjoyed with great diligence and success. At Flor-

ence, under Demetrius Chalcondylas, who had fled from Constantinople when it was taken by the Turks, he acquired a perfect knowledge of the Greek language.

"He studied eloquence at Bologna under Politian, one of the most elegant Latinists in Europe; and while he was at Rome he devoted himself to medicine and the study of natural philosophy, under Hermolaus Barbarus. Linacre was the first Englishman who read Aristotle and Galen in the original Greek. On his return to England, having taken the degree of M. D. at Oxford, he gave lectures in physic, and taught the Greek language in that university. His reputation soon became so high, that King Henry VII, called him to court, and intrusted him with the care of the health and education of his son Prince Arthur. To show the extent of his acquirements, I may mention, that he instructed Princess Catherine in the Italian language, and that he published a work on mathematics, which he dedicated to his pupil Prince Arthur. A treatist on grammar, which has universally been acknowledged to be a work of great erudition, is from the pen of Linacre: Melancthon, indeed, pronounces it to be inferior to none of its kind then extant. In his own style he reminds one of the elegance of Terence, and in his medical treatises very nearly approaches the clear and perspicuous language of Celsus."

In summing up Mead's career, MacMichael concludes: "After his death, it was said of him, that of all physicians who had ever flourished he gained the most, spent the most, and enjoyed the highest fame during his lifetime, not only in his own but in foreign countries."

Wilbur C. Abbott some years ago published a series of biographical essays under the title "Conflicts with Oblivion." The basic idea underlying his volume was the thought that each of us in his individual fashion makes his bid for immortality. Some like the great statesman, the great soldier, the great scientist achieve this goal by what they have done. In the medical field, Jenner, Pasteur, Walter Reed are examples of this class. Some gain immortality by what they are. Boerhaave, Johannes Mueller, Osler, Welch, are instances which come readily to mind. A greater

number attain a degree of immortality by what they think and write. To this latter group belonged Richard Mead; and his chief writings give us a clearer idea of his significance than any of the external facts of his brilliant and successful life.

Mead produced six literary works of major importance in addition to several minor ones. A brief review of these contributions will indicate the intellectual background against which he worked and the degree to which he transcended the limits of that background.

His earliest contribution was entitled "A Mechanical Account of Poisons" and was first published in 1702 six years after he began practice. In the first edition of this work Mead imagined he could account for the action of various poisons on the basis of their direct mechanical effects upon the blood. In later versions he modified this position very substantially, saying in the definitive edition of 1747, "I think truth never comes so well recommended as from one who owns his error." In this last edition he refers to the work of Newton and interprets the action of poisons in terms of chemical and electrical effects on the "vital spirits" or "nervous fluid," similar to the influences supposed by Sir Isaac to be propagated through the "universal elastic matter of the universe."

The book begins with a discussion of snake venom, including reports of elementary but highly courageous experiments made by the author. He collected snake venom from the living animal, made chemical tests of it and examined the crystals which developed in it, under the microscope. He conducted experiments with animals, proving that the venom itself and no occult influence of the viper caused the symptoms. He and his friends tasted venom to prove that it was not poisonous when taken by mouth. His method of treatment was modern, including major emphasis on sucking the poison out of the wound. There, next, follows a brief discussion of the bite of the tarantula and its cure by music, which causes the patient to dance and throw off the poison. (Again a naturalistic explanation). Chapter III "Of the Mad Dog" includes a good description of rabies which is included as one of the diseases caused by "poisons" with recommendation for treat-

ment by diuretics and cold baths. Poisonous minerals are then discussed, particularly mercury and arsenic, and poisonous plants, with emphasis on hemlock and aconite. A brief section on opium follows, and the book concludes with an interesting section on "Venomous exhalations from the earth, poisonous airs and waters." There is an extensive description of the Grotto of the Dog near Lago d'Agnano, where Mead had apparently himself experimented. The bottom of this cave was occupied by a layer of air which was highly mephitic (perhaps simply CO_2). He thought "vitriolic particles" were present which inhibited the power of nervous liquor to cause respiration, and explains the mephitic effects in epidemic disease by the same cause. He makes a very interesting distinction between a true poison which acts directly on the tissues and such mephitic influences which affect the state of the body in a way which he considers quite different.

Physiological theory was obviously in its infancy but, in at least three respects, Mead was a thorough modern. He maintains throughout a mechanistic approach with an indomitable conviction that biological phenomena were governed by physical and chemical laws. He relies upon experiment to unveil those laws. And he is eager and open-minded in the attempt to utilize the newest results of the physical science of the day in explaining the reactions which occur in living tissue. If Mead had not become involved in the responsibilities of active practice, this work suggests that he might have made a real name for himself as an experimental physiologist.

His second work "On the Influence of the Sun and Moon upon Human Bodies and the Diseases Thereby Produced" was published two years later, in 1704.

This essay is an attempt to explain celestial influences on health (which were of course accepted as real by all philosophers of the time) on the basis of Newtonian mechanics. There is a very interesting appeal for theoretical analysis as well as experimental observation in medicine.

"The field is large, in which we run our career; nor are the innumerable evils, with which we are daily surrounded, to be remedied by any one method. The two great pillars of medicine are experience and reason; and he that has no confidence in the

latter, at least bids the fairer towards relieving the sick, in proportion to his stock of the former. But yet the business of our profession requires the joint assistance of both; because a rational theory will teach a man to apply his experimental knowledge to the various cases that occur."

He assumes that the pressure of the atmosphere is affected by the sun, moon and stars to produce changes analogous to those of the tides and that these regular effects are modified by the winds. The variations in pressure and elasticity of the atmosphere are supposed to exert their effect chiefly on the nervous fluid. Among the particular diseases believed to follow regular lunar cycles are epilepsy, hysteria, menstrual disorders, nephritis, ulcers and asthma.

Mead's third major work, "A Discourse on the Plague" was published in 1720 and went through seven editions in one year. The eighth enlarged edition was published in 1723 with a new chapter on treatment and the final revision in 1744. This document will be discussed more fully later on, as Mead's really outstanding contribution to medicine and public health.

After the first appearance of the Discourse on the Plague, when Mead was 47 years of age, there was a long period of twenty-seven years during which no new contributions to literature came from his pen. This, of course, corresponds to the height of his activity as a fashionable practitioner. At the age of 74 he began to find leisure for writing once more and in 1747 published his fourth major work, "A Discourse on the Smallpox and Measles."

The preface to this work contains a somewhat ill-judged personal attack on Woodward, referring back to the old controversy between that gentleman and Freind and Mead. This is the only incident with which I am familiar of a lapse on Mead's part from the precious virtues of tolerance and charity which he normally exemplified. The book as a whole is not a particularly important one, and is essentially a brief for the mode of treatment (bleeding and purging) of which Woodward disapproved. Mead argues that "Pestilential fevers are those which are accompanied with some sort of poison," which affects particularly the nervous fluid. Fever, in the words of Sydenham, is "an effort of nature to

throw off the morbific matter." Therefore the obvious remedy is bleeding and purging to assist in this effort. The essay also includes, however, a strong argument for the practice of inoculation. Mead says that scarce one in a hundred of those so treated will die, and attributes the lightness of the inoculated disease to the fact that the patient is primarily in good health and is kept under the best hygienic conditions.

Mead appends to this volume a translation of Rhazes' treatise on the smallpox and measles, which he had prepared from an Arabic version obtained for him by Boerhaave.

Two years later, in 1749, Mead made a minor but interesting contribution in the form of a "Preface and Comments on Mr. Sutton's Method for Extracting the Foul Air out of Ships and Discourse on the Scurvy."

Samuel Sutton had devised a simple and ingenious method of purifying the air in the holds of ships by leading a pipe from the hold to the fire under the boilers of the ship so as to create an exhaust current, and was finding great difficulty in persuading the Admiralty to try it out. Mead was much impressed with the discovery which, he said, "will in time be found to be of more public benefit than any discovery in mechanics which has been produced these hundred years." He was successful in securing a trial and Maty says:

"Without the interposition of Dr. Mead there is great reason to fear that the intervention of Mr. Sutton, to draw out all the foul and corrupted air, from ships and other close and confined places, by the means of fire, would have shared the same fate with many other useful discoveries, which ignorance, jealousy, and often private interest, have stifled in their birth. But fortunately our illustrious Patron of Sciences, being at first sight convinced of the advantages of this method, and looking on it as the most useful discovery in mechanics, that this or the last age had produced, was determined to allow time and patience for the perfecting a scheme which he was positive could not but succeed in the end; accordingly he engaged the Lords of the Admiralty to order a trial of the new machine to be made, at which he himself assisted with them, and several Fellows of the Royal Society,

whom he had interested in the same cause: he presented a Memorial to that learned body, wherein he has clearly demonstrated, both its simplicity and efficacy, and likewise caused a model of it to be made in copper, which he deposited in their Museum. At last, after a ten years tedious sollicitation, he did obtain of the Lords of the Admiralty, an order to Mr. Sutton to provide all the ships of his Majesty's navy, with this useful machine."

It is of interest to note that Stephen Hales' description of mechanical ventilators had been published in 1743, but Mead was apparently unfamiliar with this important contribution to the art.

The volume we are now considering includes an introduction by Mead, letters and reports by Sutton and by William Watson, and an appendix by Mead entitled, "Discourse on Scurvy." Scurvy, he interprets as a corruption of the blood associated with northern climates and with "the use of stagnating and saltish water, and the unwholesome food of hard, dried and salted meats." He cites the success of Sir Charles Wager in controlling scurvy in the Baltic fleet by the use of oranges and lemons, a lesson learned by Wager from the Dutch. Mead's ideas of the disease were therefore reasonably clear. He thought that wine vinegar would serve as well as fruit juices, which is very probably correct.

Mead believed that scurvy was more difficult to control on sea than on land because on Lord Anson's voyage around the world, warm climates and fresh provisions and wholesome rain water had failed to check it; and that the particular virulence of "sea scurvy" was due to foul air. The harmful influence of the air of enclosed spaces he considered to be due to a loss of elasticity of the air, and Sutton's device was assumed to provide a corrective for this condition.

Mead's fifth major contribution, "Medica Sacra," appeared in 1749; and is one of his most fascinating works. It is an attempt to interpret passages in the Bible dealing with medical matters. He says:

"My declining years having in great measure released me from those medical fatigues, in which, for the publick good, (at least as I hope) I have been employed about fifty years, I have deter-

mined to pass the short remains of life in such a sort of leisure, as may prove neither disagreeable to myself, nor useless to others. For good men are of opinion, that we must give an account even of our idle hours, and therefore thought it necessary, that they should be always well spent."

The main argument of this tract is a plea for a sensible and natural interpretation of the events in the Bible attributed to supernatural causes. Mead's handling of Biblical events is reverent and dignified, but with a consistent effort to emphasize natural law and to minimize the idea of irrational divine punishments and the intense emphasis of many commentators on the influence of demons. He says in this connection:

"And indeed it is frequently to me a matter of wonder, why our spiritual guides so strenuously insist on exhibiting devils on the stage, in order to make the divinity of Christ triumph over these infernal enemies. Is Christ's divine power less manifested by the cure of the most grievous diseases, performed in an instant at his command; than by the expulsion of evil spirits out of the bodies of men? Certainly all the wonderful things done by him for the good of mankind, such as restoring sight to the blind, firmness and flexibility to relaxed or contracted nerves, calling the dead to life, changing the properties of the elements, and others of the same kind, are testimonies of the omnipotence of the Creator of the world, and demonstrate the presence of God; who alone commands all nature, and at his pleasure changes and inverts the order of things established by himself. Wherefore it cannot be doubted, that He, who has performed these things, had the devils subject to him, that they might not obstruct his gracious resolutions of revealing the will of his Father to men, and correcting their depraved morals."

The disease of Job he considers to have been either leprosy or elephantiasis and he says "It is proper to remember, that it is not Job himself, or his friends, but the author of the book that attributes his calamities to Satan." Leprosy is discussed at some length and the possibility of contagion by direct exposure, by fomites and by infected houses is recognized, following Fracas-

torius very closely. Mead interprets the madness of Saul and of Nebuchadnezzar as forms of ordinary mental disease rather than direct afflictions from God in a non-natural sense.

Solomon's account of old age is described at great length with ingenious but somewhat over-subtle medical interpretations of prophetic phrases. In connection with the healing of palsy by bathing in pools, Mead invokes the beneficial effects of mineral waters.

A discussion of insanity which follows is of considerable interest from its recognition of the relationship between ordinary emotional stress and acute mental disease.

"Wherefore all madness is a disease of an injured imagination, which derives its origin from the mind, having been too long a time fixed on any one subject. Hence proceed uneasiness and anxieties of mind concerning the event. And by how much the things, whose images incessantly occur to the imagination, are of greater moment in life, the more violently they disturb the person; examples of which we see particularly in love and religion, wherein hope, fear, despair, and other contrary passions, succeeding each other by turns, drag the person different ways. That this is the case, will not be doubted by any one, who recollects, that a madman often has a good memory; manages his affairs, except when some vain ideas come across his mind, with tolerable prudence, nay sometimes with more than ordinary cunning; and that he oftimes recovers the entire and permanent use of his reason, by a course of proper medicines. Therefore in this disorder the person is first overwhelmed by terrifying ideas, which are followed by wrath and fury, as attendants on anxiety: when he threatens and attempts to do acts of the utmost cruelty to those who approach him, and through excess of anguish, frequently lays violent hands even on himself: then he grows again melancholick; and thus rage and dejection of spirits affect him alternately: moreover it is no uncommon thing to see a person under these circumstances, especially when the disease has taken deep root by length of time, seeking unfrequented and solitary places, in order to avoid the conversation of his fellow creatures."

In this work, as in his first book on poisons, one is deeply

impressed with Mead's conviction of natural causation and the courage and insight with which he sought to bring all phenomena under the rule of physical law.

His sixth and last work was "Medical Precepts and Cautions" published in 1751 when the writer was 78 years of age. This distillate of a long life of medical practice and philosophical thinking is a general discussion of the symptoms and treatment of various diseases designed apparently for the general public. Maty says of it:

"His last, and perhaps the most useful of all his works, is his Medical Rules and Admonitions: herein with a candor and simplicity so characteristical of a great man, he freely communicates all the discoveries, that his long practice and experience had opened to him, with regard to different diseases, and their several cures; he concludes with many salutary precepts for preserving the organs of the body and the faculties of the mind perfect and entire to a good old age; and he who at fourscore teaches the art of longaevity, gives his lessons with as good a grace, as his scholars may learn them with a great advantage. We see at one view in this last book, how much the art hath gained by such a length of time, and so successful a practice. This is a legacy that our author hath bequeathed to his brethren; valuable, not only for the good it may do, but likewise as it shews the excellent mind of the Testator. To be able to account in such a manner to posterity for the use of his time, to consecrate the last moments of his life to the advancement of science and the good of mankind: how worthy is that man to have lived, who dies thus employed!"

The book begins with a general description of the human body and its functions from which the following paragraph may be cited.

"Wherefore, in order to form a just notion of the body of man, it ought to be considered as a hydraulick machine contrived with the most exquisite art, in which there are numberless tubes, properly adjusted and disposed for the conveyance of fluids of different kinds. Of these the principal is the blood, from which are derived the several humours subservient to the various uses and purposes of life; and in particular that subtle and remarkable elastick fluid,

generated in the brain, and known by the name of animal spirits, the instrument of sense and motion: which functions it never could be capable of executing, were it not contained in proper organs. For this purpose, the almighty Creator has formed two sorts of fibres, the fleshy and the nervous, as receptacles of this active principle; and each sort of these is partly interwoven in the membranes of the body, and partly collected into bundles or cords, and attached to the limbs, for performing their motions with the assistance of the bones."

Coordination between the various parts is discussed as follows:

"Hence it manifestly appears, that the animal machine is made not by parts, but altogether; seeing it is impossible, that a circle of motions, some of which depend on others, be completed, without all their instruments being in their proper places. For example, how can the heart contract, to push the blood forward, without the assistance of the animal spirits; or the spirits be secreted without the brain? And so of all the other principal parts. Wherefore the animalcula, which by the help of microscopes we discover swimming in the semen masculinum, are really little men; which being received into the womb, are there cherished as in a nest, and grow in due time to a proper size for exclusion. Therefore Hippocrates said very justly: In the body there is no beginning, but all the parts are equally the beginning and end."

Next Mead proceeds to a discussion of the various fevers, in connection with which the basic principle of attempting to aid the body in the expulsion of the poison is always stressed. In connection with "slow fever" (tuberculosis) milk is recommended, but so is horseback riding. The readiness to advise violent physical exercise for this disease continued, it may be recalled, until the end of the nineteenth century.

Curiously enough insanity is discussed in one chapter, and affections of the mind in a much later one. Here as everywhere else major emphasis is laid on bleeding, cathartics and diuretics, but there is one excellent passage on mental hygiene, which reads as follows:

"But it ought to be a standing rule, to inculcate notions directly contrary to those, with which they were long possessed; in order to inure the mind by degrees to a new way of thinking. For as in the case of a body, broken with sickness or fatigues, rest and intermission of labour are proper to be ordered; so it is requisite, by all practicable means, to draw off the mind from those vain fancies, which it has imbibed. And this we shall compass, if we turn it upon objects, which excite different motions in it. Thus in imaginary fears of long duration, it is sometimes beneficial to affright the patient with real dangers. But these real terrors must in their own nature be quite unlike their false or imaginary ones, in order to cause a different agitation in the mind. For the mind cannot be absolutely at rest, though it may be free from care and anxiety: and a change of ideas may be deemed a recreation and relaxation from studies: just as the muscles of the limbs, when tired with any one sort of labour, are refreshed by putting them on different actions."

Bleeding is recommended even for heart disease "unless the patient be very weak" and for bloody flux.

There is a long chapter on dropsy with many prescriptions for special diuretics and a discussion of "tapping" in which is quoted a grave-stone in Bunhill Fields whose inscription reads as follows:

Here lies Dame MARY PAGE,
Relict of Sir GREGORY PAGE, Baronet.

She departed this life March iv. MDCCXXVIII.
In the LVI year of her age.

In LXVII months she was tapped LXVI times,
Had taken away CCXL gallons of water,
Without ever repining at her case,
Or ever fearing the operation.

Mead considered diabetes as a disease of the liver. In connection with diseases of the kidneys he commended highly new methods being introduced for "cutting for the stone."

The chapter on scurvy contains an admirable passage on treatment.

"With regard to the cure, it is much easier to prevent the Scurvy than to remove it; for when it has once taken root in the body, it is very difficult to drive it out by medicines. Now its best remedy is good wholesome air, and proper diet. Wherefore, as soon as a person is taken ill, if he be at sea, he ought to alter his situation as soon as possible, and get on shore, to breathe the land air; but if on land, he should go into the country for the benefit of purer, open air. And in both cases, what flesh he eats should be fresh and tender; but the greatest part of his food ought to be vegetables, both such as abound in a volatile salt, as scurvy-grass, cresses, brook-lime, and the like; and those which are of a cooling nature, as sorrel, endive, lettuce, purslain, and others of this kind. And it will often be beneficial to eat all these, or some of each sort promiscuously together. But the greatest service may be expected from subacid fruits, as lemons, oranges, and pomegranates, eaten frequently, upon account of their cooling and subastringent quality."

The closing chapter on personal hygiene emphasizes moderation and variety in Hippocratic fashion.

Any medical book of this period arouses a certain sense of pathos as one sees keen and acute intellects, feeling their way about in a fog of inadequate physiological knowledge. Since the days of Hippocrates—and before—devoted and skilled clinicians had observed symptoms without real understanding and applied treatments without adequate controls; and no appreciable progress was made. In the sixteenth century Harvey had at last found the right road; and in the seventeenth century Mead clearly understood the two basic principles of progress—sound theoretical analysis and controlled experimentation. The general application of these principles was still, however, for the future.

We may now return to that one of Richard Mead's contributions to scientific literature which was of most far-reaching and permanent importance—the Discourse on the Plague. As first published this was a small pamphlet of about 7000 words, the first third devoted to "Nature of Contagion," the last two-thirds to "Methods to Prevent Contagion." In later editions it grew to

much larger proportions with a preface of 6000 words; Part I "On the Plague in General" (11,000 words), including chapters on the origin and nature of the plague and on causes which spread the plague; and Part II "On the Methods to be taken Against the Plague" (11,000 words), including chapters on preventing infection from other countries, on "stopping the progress of the plague, if it should enter our country" and on "the cure of the plague." In the analysis which follows, citations are chiefly from the Second Dublin edition of 1721, which represents essentially the original form and from the final revision of 1744 as reprinted in the 1767 Dublin edition of Mead's collected works.

In the explanation of the mysterious phenomena of epidemic disease five different sorts of causes had been invoked ever since the days of the Hippocratic writings. These five causes may be briefly designated, respectively, as (1) the wrath of the gods, (2) the general epidemic constitution of the atmosphere, (3) local miasmatic conditions due to climate, season and organic decomposition, (4) contagion and (5) variations in individual vital resistance. The first of these factors had been discarded by serious students since the time of the Greeks and the fifth was a vague conception only invoked to explain individual exceptions to the general rule. A study of theories of epidemiology, from Hippocreates down to Pasteur, centers therefore about the relative emphasis laid upon epidemic constitution of the atmosphere, local miasms and contagion.

To the modern scientist it is often difficult to realize why the development of the concept of contagion was so slow and, particularly, why it was generally emphasized by laymen while physicians laid stress upon epidemic constitution and miasmatic influence. Thucydides described the plague as contagious but Hippocrates considered it to be caused by a corruption of the atmosphere which he corrected by burning spices in the streets. The Princes of the Church instituted quarantine measures for the practical control of leprosy in the sixth century and the maritime cities throughout Europe did the same for plague in the fourteenth. At this latter period when the great pandemic of plague was devastating the whole world a few medical pioneers, particularly Ibn al-Khatīb

and the anonymous " practitioner of Montpeleier " laid considerable stress upon contagion; but the medical faculty of Paris represented prevailing orthodox opinion when it reported in 1348 that " the immediate cause of the present epidemic " was a malign conjunction of planets over the Indian Ocean which produced " corrupt vapors," " raised up and disseminated through the air by the blasts of the heavy and turbid southerly winds." In the sixteenth century, Fracastorius advanced his own carefully thought-out and logical theory of contagion; but two hundred years later the controversy still raged, with the leaders of medicine still emphasizing atmospheric rather than contagionistic influences as the major factors in producing epidemics. When Marseilles suffered from the plague in 1720 (the outbreak which caused the Lords of the Regency to call upon Mead for his report) the anonymous author of the " Relation historique de tout ce qui s'est passé à Marseille pendent la dernière Peste " was a contagionist; but Chicoyneau and other leaders of the medical profession at Marseilles strongly upheld the miasmatic theory. Even a century after Mead the same conflict of opinion continued. The First Report of the Metropolitan Sanitary Commission of London in 1848 categorically declares " that there is no evidence that cholera spreads by the communication of the infected with the healthy."

We cannot by any means dismiss the resistance of the medical profession to the doctrine of contagion as merely an evidence of hide-bound conservatism. There were sound reasons for this attitude. The layman perceived the broad truth of contagion as he watched the plague spread from country to country and from seaport to seaport; but the physician, knowing the facts more intimately, realized that no existing theory of contagion taken by itself could possibly explain those facts. Contagion before the germ theory (and even Fracastorius had no conception of living germs) consisted in the direct passage of some chemical or physical influence from a sick person to a susceptible victim by contact or fomites or through a relatively short space of the atmosphere. The physician knew that such a theory was clearly inadequate. Cases occurred without any possibility of such a direct influence. Cases failed to occur when such a direct influence was present. Epidemics

broke out without the introduction into the locality of any recognizable case from without; and within the city or country they raged in a particular section and failed completely to spread beyond the borders of that area. Outbreaks began and outbreaks ceased without any causes that could be directly related to the presence or the absence of the sick. Until the theory of inanimate contagion was replaced by a theory of living germs and until to that theory were added the concepts of long-distance transmission by water and food supplies and, above all, of human and animal carriers—the hypothesis of contagion simply would not work. The task of the epidemiologist of this period was to supplement the conception of contagion by the simplest and most rational "x" factor which would serve to explain the observed phenomena. It was this task which Mead accomplished more adequately than any other writer of his time.

The theory of divine wrath as a cause of epidemic disease does not occupy much space in Mead's writings. He begins his later editions with reference to the conception that epidemics were judgments of God and counters with arguments based on Hippocrates' great dictum that no sickness is more divine than any other, all coming from the Gods but all owning natural causes. He recognizes, as almost all writers have done, the possible influence of individual resistance as influenced by personal hygiene though without laying great stress upon this factor.

Most remarkable is the fact that the theory of a general, more or less world-wide, epidemic constitution of the atmosphere (as distinct from purely local miasmatic conditions) finds almost no place in Mead's philosophy. This had been a current and accepted doctrine since the days of Hippocrates and it was to continue to play a major rôle in epidemiology through the whole of the Eighteenth Century. It was to be the dominant theory advanced by our own Noah Webster in his great work on Epidemic and Pestilential Fevers published in 1799 and accepted by Benjamin Rush as authoritative and conclusive at that time. Mead does not combat this theory. He scarcely alludes to it. It was characteristic of his naturalistic and experimental tone of thought that he seized upon the two immediate practical factors of contagion

and local miasms and quietly ignored the more philosophical conception which he found unnecessary to explain the observed phenomena with which he was familiar.

He states his theory quite clearly in the first edition of the "Discourse"—a brief pamphlet of some forty pages—as follows: "Contagion is propagated by three causes, the air, Diseased Persons and Goods transported from infected Places." We may consider diseased persons and goods as merely two forms of contagion in the modern sense—so that Mead's three factors reduce to two, air and contagion, with major emphasis on the latter. In the later edition he begins with a discussion of the history of the plague in various countries and continues as follows:

"I have been thus particular in tracing the Plague up to its first origin, in order to remove, as much as possible, all objection against what I shall say of the causes, which excite and propagate it among us. This is done by contagion. Those who are strangers to the full power of this, that is, those who do not understand how subtle it is, and how widely the distemper may be spread by infection, ascribe the rise of it wholly to the malignant quality of the air in all places, wherever it happens; and, on the other hand, some have thought that the consideration of the infectious nature of the disease must exclude all regard to the influence of the air: whereas the contagion accompanying the disease, and the disposition of the air to promote that contagion, ought equally to be considered; both being necessary to give the distemper full force. The design therefore of this chapter, is to make a proper ballance between these two, and to set just limits to the effects of each."

We must first understand what Mead had in mind in his conception of the aerial or miasmatic factor in the causation of the plague.

Like the Hippocratic writers, he considers that the air may be corrupted by heat, rain and southerly winds. Above all, however, he lays stress on the influence of organic decomposition. He says,

"It has besides been remarked in all Times, that the Stinks of *stagnating Waters* in hot Weather, *putrid Exhalations* from the

Earth; and above all, the Corruption of dead *Carcasses* lying unburied, have occasioned *infectious Diseases.*

"From hence it appears to be Concurrence of Causes, that produces Diseases of this Kind." (1721).

Plagues arise usually in southern countries: "Indeed *Plagues* seem to be of the Growth of the *Eastern* and *Southern* Parts of the World, and to be transmitted from them into colder Climates by the Way of *Commerce.* Nor do I think, that in this *Island* particularly there is any one Instance of a *Pestilential* Disease among us of great Consequence; which we did not receive from other *Infected* Places."

Hot, moist air is highly favorable. Air, however, does not carry infection from place to place without the aid of infection by people or fomites. This is proved by irregularities of spread. Mead says:

"I own it cannot be demonstrated, that when the Plague makes great ravage in any town, the number of sick shall never be great enough to load the air with infectious effluvia, emitted from them in such plenty, that they may be conveyed by the winds into a neighbouring town or village without being dispersed so much as to hinder their producing any ill effects; especially since it is not unusual for the air to be so far charged with these noxious atoms, as to leave no place within the infected town secure: insomuch that when the distemper is at its heighth, all shall be indifferently infected, as well those who keep from the sick, as those who are near them; though at the beginning of a Plague to avoid all communication with the diseased, is an effectual defence. However, I do not think this is often the case: just as the smoke, with which the air of the city of London is constantly impregnated, especially in winter, is not carried many miles distant; though the quantity of it is vastly greater than the quantity of infectious effluvia, that the most mortal Plague could generate." (1744).

Miasmatic influences cannot cause plague—in England at least—without the factor of contagion. Therefore Mead opposes Sydenham's view that plague occurs from natural causes every 30 or

40 years—a fatalistic concept which would have rendered the practice of quarantine of little avail.

Mead's concept of the relation between endemic and epidemic diseases was again discussed in his monograph on smallpox and measles (1747) where he says:

"Now upon mature consideration of the whole affair, I am inclined to think that there are certain diseases, which are originally engendered and propagated in certain countries, as in their native soil. These by Hippocrates are called diseases of the country; and some of them, sprung up in various parts of Europe and Asia, from peculiar defects in the air, soil and waters, he has most accurately described; but the more modern Greeks called them endemick diseases. These, in my opinion, always existed in their respective native places, as proceeding from the same natural causes perpetually exerting themselves.

"It is found by experience, that some of these are contagious, and that the contagion is frequently propagated to very remote countries by means suitable to the nature of this or that disease. For some not only communicate the infection by immediate contact of the sound with the morbid body, but have such force, that they spread their pernicious seeds by emitting very subtile particles; which lighting on soft spongy substances, such as cotton, wool, raw-silk, and cloathing, penetrate into them, and there remain pent up for a considerable time: in the same manner as I have elsewhere accounted for the wide progress of the plague from Africa its original country. Others, on the contrary, are infectious by contact alone. Wherefore the first sort may be spread by commerce, but the latter by cohabitation only."

The causes which lead to generation of miasms are discussed in Medical Precepts and Cautions (1751) as follows:

"Now, this matter, in my opinion at least, stands thus: that the manifest qualities of the air have a considerable share in producing epidemick diseases, is a point that admits of no doubt; but there are other conjunct causes, which alter the force of those qualities, either by encreasing or diminishing them. These chiefly spring from the earth, as Lucretius wisely said,

When she's grown putrid by the rains, and sweats
Such noxious vapours, press'd by scorching heats.

"Now as this terrestrial putridity is chiefly occasioned by rotted vegetables, and sometimes also by the dead bodies of animals, and by minerals; so the waters, especially of lakes and morasses, which have their plants and animals, in the same manner frequently exhale pestilential vapours, which infect the circumambient air. In this class may be ranged, though rarely happening in our climes, inundations, earth-quakes, eruptions from mountains, and all other remarkable and uncommon phaenomena of nature, which are capable of filling the air we breathe, with particles offensive to animal life. For these affect our bodies, and prepare them for the easy reception of diseases."

The influence of meteorological and geological phenomena in this passage is one of the rare reference in Mead's writings to the classical doctrine of "epidemic constitution" aside from miasms of decay.

We may proceed next to a consideration of the inter-relationship between atmospheric and contagionistic factors, which Mead states very clearly in the following paragraphs from the original discourse.

"But to return to the Consideration of the Air, which we left in a putrid State: It is to be observed, that Putrefaction is a kind of Fermentation, and that all Bodies in a Ferment emit a volatile active Spirit, of Power to agitate, and put into intestine Motions, that is, to change the Nature of other Fluids into which it insinuates itself."

"This is one Step towards *Contagion.* The next, as it seems to me, proceeds after this Manner. The Blood in all *Malignant Fevers,* especially *Pestilential* ones, at the latter End of the Disease, does like Fermenting Liquors throw off a great Quantity of active Particles upon the several *Glands* of the Body, particularly on those of the Mouth and Skin, from which the Secretions are naturally the most constant and large. These, in *Pestilential* Cases, although the Air be in a right State, will generally infect those, who are very near to the sick Person; otherwise are soon

dispersed and lost: But when in an evil Disposition of This they meet with the subtle Parts, its Corruption has generated, by uniting with them they become much more active and powerful, and likewise more durable and lasting, so as to form an Infectious Matter capable of conveying the Mischief to a great Distance from the diseased Body, out of which it was produced.

"A corrupted State of Air is without doubt necessary to give these Contagious Atoms their full Force; for otherwise it were not easy to conceive how the Plague, when once it had seized any Place, should ever cease, but with the destruction of all the Inhabitants: Which is readily accounted for by supposing an Emendation of the Qualities of the Air, and the restoring of it to a healthy State capable of dissipating and suppressing the Malignity.

"On the other hand it is evident, that *Infection* is not received from the Air itself, however predisposed, without the Concurrence of something emitted from Infected Persons." (1721).

Blood is affected by the morbific effluvia; but also, and particularly, the nervous fluid. Mead says in his later revisions (referring to Newton),

"Our great philosopher, whose surprizing discoveries have exceeded the utmost expectations of the most penetrating minds, has demonstrated that there is diffused through the universe a subtile and elastick fluid of great force and activity. This he supposes to be the cause of the refraction and reflection of the rays of light; and that by its vibrations light communicates heat to bodies: and, moreover, that this readily pervading all bodies, produces many of their effects upon one another.

"Now it is not improbable that the animal spirits are a thin liquor, separated in the brain, and from thence derived into the nerves, of such a nature that it admits, and has incorporated with it, a great quantity of this elastick fluid: which makes it a vital substance of great energy. And a liquor of this kind must be very susceptible of alterations from other active bodies of a different nature from it, if they approach to and are mixed with it: as we see some chemical spirits upon their being put together, fall into a fermentation, and make a composition of a quite different kind.

"If therefore we allow the effluvia or exhalations from a corrupted mass of humours in a body that has the Plague to be volatile and fiery particles, carrying with them the qualities, of those fermenting juices from which they proceed; it will not be hard to conceive how these may, when received into the nervous fluid of a sound person, excite in it such intestine motions as may make it to partake of their own properties, and become more unfit for the purposes of the animal oeconomy." (1744).

We may consider next Mead's arguments for the major importance of contagion. In passing, however, it should be emphasized once more that he was wholly right in recognizing that something more than contagion alone was essential for an explanation of the epidemiology of plague (or of cholera or typhoid or most of the other great epidemic diseases). To account for the fact that outbreaks occur at one time or at one place and not at another, it was necessary to assume another "x" factor. Such a factor, or factors, we can now assume to be the presence of rats and fleas; but in Mead's time and with Mead's theory of contagion a chemical corruption of the atmosphere was by far the most logical influence to invoke.

In arguing for the reality and importance of contagion, Mead in his later editions is clear and vigorous as to one vital point—the individual specificity of plague and other epidemic diseases. Sydenham had assumed that one disease could be transformed into another and for a century after Mead the same doctrine was maintained by Webster and Rush and LaRoche with regard to yellow fever. Mead's incisive practical mind would tolerate no such assumption.

He says, in this connection, "I cannot but very much admire to see Dr. Chicoyneau, and the other physicians, who first gave us observations on the Plague, when at Marseilles, relate in the reflections, they afterwards published upon those observations, the case of a man, who was seized with the Plague, upon his burying a young woman dead of it, when no one else dared to approach the body; and yet to see them ascribe his disease, not to his being infected by the woman, but solely to his grief for the loss of her,

to whom he had made love, and to a Diarrhoea, which had been some time upon him. No question but these concurred to make his disease the more violent; and perhaps even exposed him to contract the infection: but why should it be supposed, that he was not infected, I cannot imagine, when there was so plain an appearance of it. I am as much at a loss to find any colour of reason for their denying infection in another case, they relate, of a young lady seized with the Plague, upon the sudden sight of a pestilential tumor, just broke out upon her maid; not allowing any thing but the lady's surprize to be the cause of her illness."

He refers to the experiments of Deidier who thought he had transmitted plague to dogs by injection of bile from persons dead of the disease; while one of these dogs had previously eaten the flesh of corpses without injury. This was held to prove that the disease was not contagious but due to corruption of the bile caused by unwholesome food. Mead points out clearly the weakness of such reasoning and concludes:

"The right inference to be made from the experiments, I think, would have been this: that since the blood and all the humours are so greatly corrupted in the Plague, as that dogs (though not so liable to catch the distemper in the ordinary way of infection, as men are) may receive it by a small quantity of any of these from a diseased subject being mixed with their blood; it may well be supposed, that the effluvia from an infected person, drawn into the body of one who is sound, may be pestiferous and productive of the like disorder."

Mead argues that spread of the disease in families proves the importance of contagion as it does in smallpox and measles; and that it cannot be fear that causes the sickening, since young children often suffer. He also cites the protection of certain colleges and monasteries by strict quarantine. The failure of some individuals to contract the disease when exposed (always stressed by opponents of contagion) he explains by variation in vital resistance. An ingenious argument for contagion is drawn from the fact that plague is most virulent at the onset of an epidemic. This

would not be so if it were bred by local conditions which should tend to build up a gradually greater virulence.

The major argument for contagion is however based on the obvious fact of its gradual progress from one country to another country. Mead claims that the sweating sickness of 1485, and the plague of 1665 were imported (the latter by cotton from Turkey); and he traces out in detail the spread of contagion in the great plague pandemic of 1349. Like all his contemporaries, however, he cannot accept the theory of living germs.

"The third Way, by which we mentioned Contagion to be spread, is by Goods transported from infected Places. It has been thought so difficult to explain the Manner of this, that some Authors have imagined Infection to be performed by the Means of Insects, the Eggs of which may be conveyed from Place to Place, and make the Disease when they come to be hatched. As this is a Supposition grounded upon no manner of Observation, I think there is no need to have Recourse to it. If, as we have conjectured, the Matter of Contagion be an active Substance, perhaps in the Nature of a Salt, generated chiefly from the Corruption of a Humane Body, it is not hard to conceive how this may be lodged and preserved in soft, porous Bodies, which are kept pressed close together."

In summary, Mead's theory of the epidemiology of plague is excellently summarized in the following paragraph:

"To return from this digression: from all that has been said, it appears, I think, very plainly, that the Plague is a real poison, which being bred in the southern parts of the world, is carried by commerce into other countries, particularly into Turkey, where it maintains itself by a kind of circulation from persons to goods: which is chiefly owing to the negligence of the people there, who are stupidly careless in this affair. That when the constitution of the air happens to favor infection, it rages there with great violence: that at that time more especially diseased persons give it to one another, and from them contagious matter is lodged in goods of a loose and soft texture, which being packed up and carried into other countries, let out when opened, the imprisoned

seeds of contagion, and produce the disease whenever the air is disposed to give them force; otherwise they may be dissipated without any considerable ill effects. And lastly, that the air does not usually diffuse and spread these to any great distance, if intercourse and commerce with the place infected be strictly prevented." (1744).

This is the essential gist of Part I of the "Discourse" which deals with the origin, nature and causes of the plague. It is this section which was expanded so greatly in the later editions of the work. Part II, on practical methods of control was but little modified from the original presentation of 1720 (except for the addition of a chapter on treatment). It is as notable for its common sense and its humanity as is Part I for its good judgment and philosophic balance.

Mead first considers defense against the importation of the plague from abroad, since he was rightly convinced that it was not an indigenous disease in England. To avoid importation, he recommends that lazarettos should be built at every port for the reception both of men and goods. Passengers and crew on an infected ship should be quarantined for 30-40 days, after the men have been washed and shaved and their clothing changed. Clothes "harbour the very Quintessence of Contagion."

If there has been no sickness on a ship, from an infected port the men should be washed and cloths and goods aired at the Lazaretto for one week.

"But the greatest Danger is from such Goods, as are apt to retain Infection, such as Cotton, Hemp and Flax, Paper or Books, Silk of all sorts, Linen, Wool, Feathers, Hair, and all kinds of Skins. The Lazaretto for these should be at a Distance from that for the Men, and they must in convenient Ware-houses be unpackt, and exposed, as much as may be, to the fresh Air for 40 Days." (1721).

In connection with the control of spread from place to place within the country, Mead recommends a quarantine of 20 days between towns but not absolute prohibition of travel. No goods or materials retentive of infection should, however, be transported.

All this was more or less standard practice on the continent; but, with regard to control methods within an area where plague had already been introduced, Mead outlined relatively new procedures. He reviews current practice as follows:

"The main Import of the Orders issued out at these Times was, As soon as it was found, that any House was infected, to keep it shut up, with *a large red Cross, and Lord have mercy upon us* on the Door; and Watchmen attending Day and Night to prevent any one's going in or out, except Physicians, Surgeons, Apothecaries, Nurses, Searchers, Etc. allowed by Authority: And this to continue at least a Month after all the Family was *dead* or *recovered*.

"It is not easy to conceive a more dismal Scene of Misery, than this; Families seized with a Distemper, which the most of any in the World requires Help and Comfort, lockt up from all their Acquaintance; left it may be to the Treatment of an inhumane Nurse (for such are often found at these Times about the Sick;) and Strangers to every thing but the melancholy Sight of the Progress, Death makes among themselves; with small Hopes of Life, and those mixed with Anxiety and Doubt, whether it be not better to Dye, than to survive the Loss of their best Friends, and nearest Relations.

"If Fear, Despair, and all Dejection of Spirits dispose the Body to receive *Contagion*, and give it a great Power, where it is received, as all Physicians agree they do, I don't see how a Disease can be more enforced, than by such a Treatment.

"Nothing can justify such Cruelty, but that Plea, that it is for the Good of the whole Community, and prevents the spreading of *Infection*. But this upon due Consideration will be found quite otherwise: For while *Contagion* is kept nursed up in a House, and continually encreased by the daily Conquests it makes, it is Impossible, but the Air should by Degrees become tainted, which by opening Windows, &c. will carry the Malignity first from House to House; and then from one Street to another. The shutting up Houses in this Manner is only keeping so many Seminaries of *Contagion*, sooner or later to be dispersed abroad: For the wait-

ing a Month, or longer, from the Death of the last Patient will avail no more, than keeping a Bale of Infected Goods unpack'd; the Poyson will fly out, whenever the *Pandora's* Box is opened." (1721).

We cannot accept this theory of concentrated miasmatic poison; but we can readily agree that such harsh measures as those commonly in use were not only inhumane but must necessarily defeat their own ends by leading to the concealment of early cases of the disease. In place of the old methods, Mead suggests the following procedure:

"There ought, in the first place, a council of health to be established, consisting of some of the principal officers of state, both ecclesiastical and civil, some of the chief magistrates of the city, two or three physicians, &c. And this council should be intrusted with such powers, as might enable them to see all their orders executed with impartial justice, and that no unnecessary hardships, under any pretence whatever, be put upon any by the officers they employ." (1744).

"Instead of ignorant old Women, who are generally appointed Searchers in Parishes to enquire what Diseases People dye of, That Office should be committed to understanding and diligent Men, whose Business it should be, as soon as they find any have dyed after an uncommon Manner, particularly with livid Spots, Buboes, or Carbuncles, to give Notice thereof to the Magistrates; who should immediately send skilful Physicians to visit the Houses in the Neighbourhood, especially of the Poorer sort, among whom this Evil generally begins; and if upon their Report it appears, that a Pestilential Distemper is broke out among the Inhabitants, They should without Delay order all the Families, in which the Sickness is to be Removed; The Sick to different Places from the Sound; but the Houses for both should be three or four Miles out of Town; and the Sound People should be stript of all their Cloaths, and washed and shaved, before they go into their new Lodgings." (1721).

Mead in 1744 recommends the removal of the sick from their

houses only in the early stages of an epidemic. When the disease has become more widespread he suggests that they be left in their homes and that even other persons resident in such houses may go freely abroad although it is suggested that "they should be obliged to carry about them a long stick of some remarkable colour, or other visible token, by which people may be warned from holding too free converse with them."

Compassion and care for the sick should animate the procedure at all stages and all expenses should be paid from the public purse.

With characteristic emphasis on fomites Mead recommends in 1721 that after the occupants have been removed all goods in infected houses should be burnt and the houses themselves also "if convenient." In 1744 he suggests that goods from infected houses should be buried instead of burned to avoid danger of distributing infectious particles in smoke. He argues against the Hippocratic procedure of lighting fires in the streets, ingeniously suggesting that heat favors the spread of contagion. He recommends the deep burying of the bodies of the dead and, of course, urges general sanitary cleansing of the streets and abatement of nuisances. For the protection of individuals he advises keeping vital resistance at a high level by observing the rules of personal hygiene. Crowds should be avoided and those in actual attendance on the sick should not draw breath when in close proximity to the patient and should avoid swallowing their spittle.

In all this, of course, Mead's thinking was tremendously handicapped by the prevailing theories of contagion. No complete solution was possible until the concept of living germs replaced that of chemical "seminaria" of contagion. With the conceptions at his disposal, however, he constructed a rational and balanced theory which combined all that was known as to the respective influences of contagion and of local influences. Between Galen and Pasteur, there were in my judgment, but two really outstanding and significant contributions to the theory of the causation of communicable disease—that of the Italian Fracastorius in the Sixteenth Century and that of the English Mead in the Eighteenth. In his theories of epidemiology, as in all his life and work, Richard Mead showed a keen and ingenious mind, a sound practical judg-

ment and a warm and urbane humanity. He lived, as Johnson said "in the broad sunshine of life"; and he worked in the clear light of reason. His personality was a fine flower of his nation, his generation and his profession. His "Discourse on Plague" has won for him a permanent place in the little group who through the ages have been classed as the fathers of epidemiology.

THE POSITION OF MAIMONIDES IN THE HISTORY OF PHILOSOPHY *

SAMUEL ROSENBLATT, PH. D.
Lecturer in Jewish Literature at the Johns Hopkins University

Ever since the decease on December 13, 1204, of the man the 800th anniversary of whose birth fell on Saturday March 30th of this year and whose position in the history of philosophy is to be the subject of this paper, ever since he passed away there has been current among his Jewish admirers the dictum that " from Moses (the son of Amram) to Moses (the son of Maimun) there has not arisen one like unto him." This epigram sums up in a single sentence Jewry's estimate of the worth and the achievements of Moses Maimonides. And it is a justified verdict, for the precocious Jewish lad of Cordova who grew into the sage of Fostat, the Spanish exile whose fame as a healer was so great that it reached even the ears of the celebrated Saladin so that he attached him to his household as court-physician, the foreigner whom the Jewish community of Egypt chose to be its chief arbiter in matters secular as well as spiritual, the student of the Talmud whom contemporary Jewry recognized as its foremost legal authority, the thinker whom the scientific world of his day esteemed as one of the leading metaphysicians of all times, was by far the most universal scholar, the profoundest intellect and the most constructive genius that the Jewish race had produced. Since Moses the lawgiver there had not been seen his equal in Israel. That is why today his coreligionists throughout the world offer up incense to his name. But it is not for Jews alone to do homage to the memory of Moses Maimonides. Non-Jews, too, whether Christian or Mohammedan, and even those who subscribe to neither of these two faiths, have reason to participate in the festivities commemorative of the birth of this Jewish giant of the spirit, for Maimonides did not belong to the Jewish people alone, nor did he derive all his greatness solely from his race. He absorbed

* Read at the Octocentennial memorial celebration of the birth of Maimonides, held by the Johns Hopkins Medical History Club and Osler Society on April 1, 1935.

knowledge from every available source. He produced fruits that were edible to all men. He took from the world and gave to the world and, therefore, because the world has a share in the legacy he has left to posterity, it behooves the world to take note of him who bequeathed it.

It is not the function of this essay to present a biography of Moses Maimonides but merely to indicate his place in the chain of systematic thinking that extends unbroken from the time of the philosophers of ancient Greece down to our own day. Yet it would be impossible to take full stock of Maimonides' contribution to philosophy without paying attention to certain salient factors of his life and surroundings which must indubitably have greatly conditioned his intellectual development. For, just as the evolution of plants, the stature and beauty they attain, depends to a large extent upon soil and climate, so every human genius is a child of his age and environment which determine the degree of his growth and also set his limitations. Plato and Aristotle, Spinoza and Kant were no doubt all of them creative minds of the highest calibre, original thinkers who blazed new trails in the realm of philosophical inquiry. Yet great as must have been their intrinsic merit, unique as they were each one of them in his day, it is equally certain that *out* of their setting they could not have become what they were. Only a sophisticated cultured Athens with a tradition of speculative thinking of several centuries could have produced a Plato. Aristotle could not have carried on his extensive experiments, which made possible his marvellous synthesis, without the vast resources of the Macedonian empire in which he resided. Spinoza's boldness was due in a great measure to his living during an era of enlightenment, when traditional notions were thrown into the discard, as Kant's profundity was nourished by the intellectual ferment of the Germany of the 18th century. The same holds true for Maimonides. He was, in his greatness as well as his shortcomings, a product of his antecedents and his milieu. His mastery of Jewish religious literature he owed to his descent from a long line of rabbis; his love of knowledge in general—to the fact that he was reared in Moorish Spain which, prior to the invasion of the fanatical Almohades, that was responsible for the banish-

ment of his family from their native Cordova when he was but thirteen years of age, was a seat of culture and learning, a culture in which Jews and Moslems collaborated equally and which about the time of Maimonides' birth had attained an excellence which was never again to be reached by the Arabic-speaking world. His almost unqualified acceptance of the scientific as well as the metaphysical doctrines of Aristotle, whose authority he regarded as infallible for everything beneath the moon, is to be ascribed to the absolute sway which the system of the Stagirite had attained in the learned world of his day thanks to the labors of Alfarabi and Ibn Sina thru whose works Maimonides became acquainted with the views of the Greek philosopher. His religious orthodoxy, again, which drove him to seek a compromise between Judaism and Greek philosophy, was due to the fact that he lived in an age in which the church, whether Jewish, Christian or Mohammedan, reigned supreme and free thought was the exception rather than the rule.

Such were the circumstances that were responsible for the particular development that the genius of Maimonides underwent, and in evaluating his intellectual achievements we must bear them in mind for without that the phenomenon that is Moses Maimonides would be absolutely incomprehensible.

To proceed now to a consideration of the position of Moses Maimonides in the history of philosophy, let it be made clear at the outset that he was not primarily a metaphysician like his Mohammedan contemporary and fellow-countryman, who like himself was a native of Cordova, Averroes, but first and foremost a theologian. The purpose of his chief philosophical work "The Guide of the Perplexed" was not speculative. It was intended to be exactly what its title implies: a beacon-light, an ensign pointing the right way to those whom the study of philosophy had caused to become spiritually confused and swerve from the beaten track of religion. The Jewish Aristotle proposed in this magnum opus of his to effect a harmonization between two different, oft-opposing, systems of thought rather than to inaugurate an entirely new structure of his own. He did it by attempting to demonstrate that there is no conflict between Judaism's revelation, when

properly understood, and the ripest fruits of human reason, which in his opinion were represented by the teachings of Aristotle as interpreted by the Arabic commentators. By Judaism properly understood Maimonides meant the Jewish creed rationalized and explained in the light of current scientific and philosophic conceptions. Such a rationalization is partly carried out in the "Guide." The author points to the fact that certain passages in the Bible in which God is spoken of as walking and talking, possessing hands and feet, eyes, ears and a mouth and other such human attributes could not possibly have been meant literally, but that these locutions were just figures of speech which are often employed by men in referring to things abstract that cannot be exactly defined by human language. If this holds true in some instances in which the metaphorical significance is evident, it may apply also to others in which it is not so obvious. Skillfully employing this method of exegesis Maimonides finds in the Hebrew Scriptures support for the Aristotelian dichotomy of reality into *matter* and *form*, for the resolution of all physical substances into the four elements of *earth, water, air* and *fire* and other metaphysical and scientific ultimates of this day. The all-too-human God of the literal version of Jewish Sacred Writ becomes abstracted into the *prime mover* who sets the processes of the universe agoing as the loved object attracts the lover. He is pure Spirit, simple, incorporeal, possessed of no human affections or attributes. The true comprehension of His essence is impossible for the human mind. The only assertions that can be made of Him are negations, i. e., when it is said God is omnipotent what is meant is not that He possesses physical power to perfection but that weakness does not appertain to Him. Thus for God. As for the angels that are mentioned in the Bible they become either the *separate intelligences*, the spiritual beings that were thought by the medieval metaphysicians to be the movers of the heavenly spheres or the word "mal'akh" may stand for any one of the elements of nature that God uses as the instruments of His will. The apparitions of the prophets too lose their substantiality. They become phantasmagoria, visions present only in the minds of those that see them who at the moment are in a sort of hypnotic state.

In this way Judaism was accommodated to the teachings of science. And yet with all the revamping of the traditional creed that Maimonides had thus performed with the skill of a master and in the utmost sincerity some gaps remained, as they were bound to remain, between a national creed like that of Israel and so universal a system as Aristotle's was, and no amount of interpretation, however ingenious and clever, could explain them away. For example the Bible posits the belief that the world was created, while Aristotle holds that it existed since eternity. Judaism asserts that God's providence extends to every living creature. The Greek philosopher, however, claims that He is indifferent. The Jewish Scriptures speak of miracles which constitute suspensions of the laws of nature. Such a view is entirely contrary to the scientific temper of the Stagirite. These doctrines that we have mentioned were regarded as basic to the Jewish religion, and to nullify them by means of exegesis would have been tantamount to cutting out the vitals from the Judaic creed. How did Maimonides solve this problem? He subjected the divergent teachings of Aristotle to a rigid critical analysis. He proved, using Aristotle's own propositions as premises, that the world must have been created in time. This conclusion, he asserts, is not necessitated by the statement of the Bible which might be interpreted if necessary to fit Aristotle's view. It is required by the demands of science. Now if God could create a world at a certain definite time just because He willed it, He should also be able to perform miracles reversing the ordinary processes of nature. Maimonides disagrees with Aristotle in the matter of God's providence, stating that, although the philosopher may be right insofar as the individuals of the lower species are concerned, when it comes to man, he must part company with him. With all his reverence for the Greek master his Jewish disciple does not find it possible to follow him everywhere. He considers him a pretty safe guide for the sublunar world, but above the moon he is no longer trustworthy.

Such is the tenor of Maimonides' philosophical masterpiece the Guide of the Perplexed, the manner in which he reconciles Judaism with Aristotle. He was neither the first nor the last to do it. He had his forerunners as well as his successors in this effort.

None of them, however, performed the task as consummately, as masterfully and completely as he did it. With the thoroughness that was characteristic of Aristotle, to whom he felt so much akin, he starts out in every investigation by presenting the views of his predecessors and pointing out their flaws. Then, after having cleared the ground, he states his own thesis. Thanks to this method of his the modern world is, as David Kaufmann remarks, in possession of a very clear expose of the metaphysical systems of the early Mohammedan theologians the doctrines of the Mutakallimun for which Maimonides' Guide of the Perplexed is the most reliable source. We are indebted to him also for a mass of information about the superstitious and idolatrous practices of his day, especially those of the Sabians, with whose rites and literature he shows himself thoroughly familiar. His conclusions regarding the origins of the Jewish ceremonial laws come very close to the findings of modern anthropologists and the theories of present-day historians of religion, whilest his analysis of the phenomenon of prophecy is worthy of a William James or a Freud.

One may agree or disagree with Maimonides. One cannot help being fascinated by him for he is always illuminating and stimulating. This fact was quickly recognized by his contemporaries Gentile as well as Jewish and accounts for the rapid dissemination of the Guide. The book, written in Arabic, which its author had purposely caused to be copied in Hebrew characters in order to confine it to Jewish readers, had scarcely made its appearance in the world, than it was transcribed into Arabic letters and eagerly studied in Mohammedan universities. Before a decade and a half had passed it enjoyed a Hebrew translation—in and by itself quite an undertaking since the philosophical terms in which the original was to be rendered had first to be invented. This translation brought the philosophical teachings of Maimonides within the reach of thousands of Jews living in non-Arabic speaking countries. Before the end of the first quarter of the 13th century there were already in existence versions of the Guide in Latin, the universal language of the Catholic church and the medium of its theologians and savants. The writings of such scholastics as William of Auvergne and Alexander of Hales already contain references to

the philosophical theories of Rabbi Moyses, the wisest of the Jews residing among the Saracens, while the greatest teachers of the medieval church, the learned Dominican Albertus Magnus and his even greater pupil Thomas Aquinas, in whom scholasticism attained the zenith of its development, quote him profusely and incorporate whole sections of the Guide in their theological compendiums. It is interesting to note that one of these Christian disciples of the Jewish rabbi, the Dominican William of Auvergne, personally participated in the burning of Maimonides' books, which were destroyed together with the Talmud in his episcopate of Paris. Yet he had no scruples against quoting him and thus preserving in his own writings in Latin what he had consigned to the flames in Hebrew. It is interesting but not at all surprising because the scaffolding erected by Rabbi Moses the Egyptian to bolster up Judaism was indispensable to the teachers of the medieval church. The need for a reconciliation with Aristotle was as great with Christians as it was with Jews, and, since the points in which the teachings of the two faiths differed from those of the Stagirite were essentially the same, it was but logical that the former should adopt the defense set up by the latter. Rightly has it been said by Emile Saisset that "Maimonides is the precursor of Saint Thomas Aquinas and that the Guide of the Perplexed announces and prepares the Summa Theologiae."

Such was the fame and the vogue achieved by the literary monument of Maimonides' speculative genius during the century following the death of its author. It had become a textbook of philosophy not for Jews alone but for Christians and Moslems as well, being quoted for corroboration or disagreement, admired and fought about, pondered and contested. In the 14th century with the decline of culture among Jews, its almost total eclipse among Moslems and the tendency towards mysticism among the doctors of the Church, the preoccupation with Maimonides' Guide diminishes. Jews still write commentaries on it and develop or combat its philosophical theories. Mohammedans, however, hardly mention it and the references to it in Christian works become rarer and rarer. With the revival of learning during the two succeeding centuries, generally known as the renaissance, the name of

Maimonides again looms up outside of Jewish literature. John Reuchlin the celebrated German humanist, the contemporary of Martin Luther and defender of the Talmud against the attacks of the Obscurantists, knows of his work. The great French jurist and political philosopher of the 16th century Jean Bodin, who was one of the outstanding scholars of his day, read the Guide of the Perplexed carefully, used it extensively and recognized its author as his teacher and guide. His countryman, Joseph Scaliger, one of the greatest and most versatile philologians, not only of his epoch but of all time, knew the Guide in its Latin and Hebrew versions as well as in the original Arabic in which it had been composed, and in a letter to the eminent French critic Casaubon stated that its greatness could not be praised sufficiently.

However it was first in the 17th century, the age of reason, that the Jewish rationalist of the 12th found his real spiritual heir in another Jew sprung from stock originating from the same country in which he was born. I refer to the humble lense-grinder and brilliant thinker of Amsterdam, Benedict Spinoza. The Guide of the Perplexed of Rabbi Moses ben Maimon was not only the first philosophical text to be studied by the first truly modern philosopher, who thru it was initiated into the world of metaphysics. It remained an abiding influence the effects of which can be traced thruout his works. Spinoza himself is, to be sure, loathe to acknowledge his indebtedness to the sage of Fostat whom he uses quite frequently as the butt of his criticism particularly in his theologico-political treatise. This circumstance should not, however, blind one to the really intimate connection existing between the philosophical systems of these two thinkers. Aristotle, also, often took exception to the views of his teacher Plato from whom he diverged considerably, and yet, for all the differences between them, the resemblance between master and pupil is unmistakable. So is it also with Spinoza in relation to Maimonides. He disagrees and yet agrees with him. Both Maimonides and Spinoza were rationalists. Both regarded the intellectual love of God, amor intellectualis dei, as the summum bonum, the end and goal of human striving. Both subordinated morality to knowledge considering the former as a preparatory stage to the latter, yet issu-

ing from it, for "when men know what is good for them, they will do it." The cause of most human misfortunes, Spinoza asserted with Maimonides, was ignorance. The world would not seem half so wrong if men would only live according to its laws. These are some of the points that Maimonides and Spinoza have in common. But their relation extends further. It can be noted even where they disagree. If the philosopher of Amsterdam with his thoroughgoing naturalistic conception of the universe denies to the human being freedom of will, stating that man's actions are predetermined, the Rabbi of Cairo while affirming this dogma of Judaism does it with the reservation that the reconciliation of man's freedom of will with the foreknowledge of God is a mystery which has not yet been solved. If Spinoza the Pantheist, who identifies God with the world, does away with the belief in Providence and counsels those who would be happy to live in accordance with the laws of nature, Maimonides who must perforce cling to a personal God informs us that the amount of attention that a human being can receive from Providence depends upon the stage of his intellectual development, and that the individuals of the lower species do not secure it at all. Finally let it be remembered that Maimonides' God is as abstract and as free from human affections as is Spinoza's Deus sive Natura, and that both claim that an adequate conception by man of the essence of deity is impossible.

From Spinoza Leibnitz, the foremost philosopher of the generation following, learned about Maimonides and his Guide. He not only studied this book but also annotated it and recommended it to be read by all thinking men. Leibnitz, who was in turn one of the most potent molding influences in the development of Kantian philosophy, accepted many of the doctrines of Maimonides, such as the one that this is the best of all possible worlds and that, if God could create the world and stipulate its laws, He could also overthrow them at His will or at least include in His plan an occasional interruption of their course.

Considering to what extent a non-Jew of the calibre of Leibnitz drew upon Maimonidean philosophy, it is not at all astonishing that a Mendelssohn and a Solomon Maimon, both of them

Jews who, like Spinoza, cut their philosophical teeth on the Guide of the Cordovan should have been influenced by him. But not only they but even Hegel, who was still further removed from the Middle Ages and closer to our own time, spoke with respect about the learned Jew of Fostat whose "Guide" he characterized as a veritable treasure house of metaphysical beauty and truth, and no less eminent a historian than the Swiss Von Mueller thought that the works of Maimonides ought to be translated into every modern language because "they are among the few books necessary for an understanding of present-day problems." This wish has been partially realized in the last and the present centuries during which adequate renderings into French, German, English, Hungarian, Italian and Spanish, based on the epoch-making edition of the original by Solomon Munk, have been prepared of the Guide of Maimonides, a book the author of which was born eight centuries ago but which, on account of the eternal truths that it contains, has not yet lost its usefulness but maintains until this day an honored place in the history of philosophy.

MOSES MAIMONIDES THE PHYSICIAN *

HARRY FRIEDENWALD

The chapter of medical history which is generally known as Arabic Medicine has grown in interest as its real significance has become apparent. It was not only the means of preservation of Greek medicine and of its transmission to western Europe by way of the Moorish invasions of Sicily and Spain; it brought contributions in new medical observations, in the recognition of certain diseases, in the introduction of new and important remedies in our pharmacopoeia; and we are further indebted to Arabic medicine for raising the medical profession to a high level by its founding of medical schools and libraries and hospitals. The Arabic period of medicine may be divided into that of the Eastern Caliphate and that of the Western; the two being different in character [1] and in time. In both divisions, large numbers of distinguished Jewish scholars took part. Indeed, Col. Garrison in his "History of Medicine," entitles this chapter "The Mohamedan and Jewish Periods." [2]

Two Jewish names stand out prominently, in the East, that of the prolific medical writer, Isaac ben Solomon Israeli, and in the West, that of Moses ben Maimon. In the Western Caliphate, "eminent Arabic writers are small in number as compared to those of the Eastern . . . Most of the Western Arabians who reached any

* Read before the Johns Hopkins Medical History Club on April 1st, 1935, at the celebration of the 800th anniversary of the birth of Moses Maimonides, held by the Johns Hopkins Medical History Club and the Osler Society.

Capitals in quotation marks ("A"—"HH") refer to bibliography at end of paper.

[1] "The medical school of the Western Caliphate was both medically and philosophically antagonistic to Avicenna, who is usually regarded as the chief representative of Arabian Medicine. The Arabic writings that emanated from the Cordovan center of Islam showed a modification, owing to its intimate contact with the Christian West, and the medical and philosophical literature issued by the Christians and Jews of Moslem Spain is based more on the practical realities and attach less importance to dialectic vanities." (Campbell "C," p. 85.)

[2] Campbell oversteps the mark when he writes in his "Arabian Medicine and its Influence on the Middle Ages":—"Although we have called this space of time 'the Arabic Period,' it can with justice be termed 'the Jewish Period,' as the Jews were closely identified with the medical culture of Islam in general and the Western Caliphate in particular."

degree of eminence, date long after Rhazes and Avicenna; the four most eminent of these were Albucasis, Avenzoar, Averroës, and Maimonides, all of whom exercised great influence over the Scholastics of the Latin West." ("C," p. 85.) It is to be noted that Avenzoar (1113-1162) was born in Seville and studied at Cordova but that Albucasis (-1106) Averroës (1126-1198) and Maimonides were born in Cordova, "the mother of philosophers" and "the light of Andalusia" ("C," 57).

We are meeting in commemoration of the 800th anniversary of the birth on March 30, 1135 of the last named—Moses ben Maimon or Maimonides, known in Arabic literature as Abu Imran Musa ibn Maimun ibn Abd Allah. He was descended from a family of Jewish scholars and obtained much of his education at the hands of his father. We have no definite information as to his instructor or instructors in medicine. We know that Cordova was the seat of an "Academy founded by the Caliphs where Jews and Moors together received instruction in philosophy, grammar, mathematics, botany, and even music, for in this city they enjoyed the same privileges and the same duties."[3] Cordova was the center of Jewish scholarship since the days when Hasdai ibn Shaprut, (915-990), a Jewish physician and a minister of finance, established a school of higher learning late in the tenth century; it was he who with the aid of a Greek monk had translated Dioscorides' Materia Medica into Arabic. We learn that in Cordova, in Toledo and in Granada "the medical schools stood in high repute."[4] We must remember that we are dealing with a period before any of the universities of Spain existed; that the first and the foremost, that of Salamanca was not founded until the middle of the 13th century and that the others followed but slowly.

Medicine was part of the discipline of Jewish scholars and the number of those is large who followed both professions of Rabbi and physician; the greatest of these was Maimonides himself.

Maimonides appeared at the time of the glorious evening glow of Arabic culture. The sun was soon to set on its science, phi-

[3] Kayserling in Jewish Encyclopedia, article "Cordova."
[4] Puschmann, "History of Medical Education," London, 1891, p. 212.

losophy, and medicine. Maimonides imbibed its learning and scholarship wholly, but was also restricted by the fetters which rendered the great advances of later centuries, impossible. The fetters were chiefly the thraldom of authority and the prohibition of anatomical study.

It was not granted to Maimonides to profit long by the educational advantages of Cordova. With the capture of the city by the Almohades in 1148, the Jews were given the choice of accepting Islam or exile. The father of Maimonides chose the latter and thus the family began its wanderings at the time when Moses was but 13 years of age. They sojourned in different towns of Spain until 1160 when they crossed into Africa and settled in Fez. Maimonides was then twenty-five years of age. We do not know in which towns they had resided,[5] nor the length of time they had spent in them. But one fact is known, that Moses' education was not interrupted and that when but 23 years of age he began to write one of his great religious works. There is abundant reason to assume that his studies embraced astronomy and mathematics, philosophy and medicine.

Students of the life of Maimonides are at a loss to explain why the family settled in Fez, for this was the capital of the Almohades who had driven the family from Cordova.[6] But we are not now concerned with the problem of their living in Fez or their adjustment to these difficulties except for the fact that Maimonides' participation in encouraging his Jewish brethren, increased his own danger and that of his family in such degree that he narrowly escaped with his life and in 1165 the wanderings of the family were again resumed;—and the family fled to Palestine and then to Egypt, attracted probably by the favorable situation of Jews in that country.

Years later he wrote " I was troubled by the suffering and exile which God visited upon me, since I was driven from one end of the world to the other." (Marx, Octocentennial Address, 1935.)

[5] But one town has been mentioned and that doubtfully, Almeria, " K," p. 8.

[6] It is generally assumed that Maimonides was attracted to Fez by the learned scholar Rabbi Judah ibn Sosan, whose disciple he became. Maimonides' departure from Fez was probably precipitated by the martyr death of ibn Sosan (Marx, Octocent. Address).

It is evident from passages in his writings that Maimonides was a student, perhaps even a practitioner of medicine before he came to Egypt. There are a number of references in his writings to conversations with medical teachers and students and to medical observations in Morocco and even in Spain. Thus he mentions that Abu Bakr had told him about such and such observations made by his father Avenzoar. Abu Bakr lived in Seville but he accompanied the caliph as physician and vizier to Fez ("K," p. 22). It may therefore have been in Fez where these scholars met; but it is possible, too, that they were friends in Seville.[7]

Maimonides reached Egypt and settled in Fostat, a suburb of Cairo, in 1165;[8] there is a possibility that the family spent some time in Alexandria even before they settled in Fostat. Not long after their coming to Fostat, the father, Maimon, died and this loss was soon followed by the death of the brother David. The latter lost his life and the wealth of the family in a shipwreck in the Indian Ocean on a voyage of business, for he dealt in precious stones; he

[7] In his Guide for the Perplexed (Friedlander, 2d edition, 1904), Maimonides speaks of ibn Aflah of Seville (abu Muhammad Jabir ibn Aflah, the astronomer) with whose son he was acquainted and Abu Bakr Muhammad ibn Yahya ibn al-Saigh, the philosopher and physician "one of whose pupils was my fellow-student." These references, however, bear only on astronomical studies (p. 164). But in the Aphorisms in speaking of Avenzoar's experiences, which he transmitted to his son "Ebilula," (Abu Bakr), he tells about purgative remedies including a number of aphorisms which were apparently passed on by word of mouth; at still another place, in a more definite statement, namely, this "the son related them to me. It may be that he also related part of them to others." In discussing diabetes, Maimonides says: "I, too, have not come across a case of this in the West nor have I heard any one of my old teachers say that he ever seen it." . . . "But here in the land of Egypt I have found persons suffering. . . ." See below.

In the work on Asthma, Maimonides discusses laxatives used in Morocco as he has himself observed. Further on, he states "all this we have learned from instruction of the doctors of Maghreb" (Morocco). At yet another place he mentions the use of certain remedies, "by all the most distinguished physicians of Andalusia and Maghreb," and referring to another remedy he makes a similar statement in his second epistle to Al-Afdal. And still at another place, he discusses the sudden death of a person of note in Morocco who died during convalescence through an error in the dose of theriaca and he mentions the names of the four physicians in attendance. The references to the book on Asthma are taken from Munk. Arch. Israel. 1851, p. 325.

[8] Zeitlin holds that Maimonides did not reach Fostat until 1171, having spent several years in Alexandria. (Maimonides, New York, 1935, p. 42.)

was the support of the family. Maimonides, who had busied himself with his studies, who had been holding lectures on Talmudic lore on philosophy, astronomy, and medicine, was now called upon to care for the family including the widow and child of the deceased brother. He took up the practice of medicine; at the time, he was rapidly acquiring fame as a scholar and teacher in Hebrew lore. He became one of the Jewish judges and the spiritual leader of the Jewish community in Cairo and of the whole of Egypt, but refused to become the official rabbi because he would not accept any remuneration for such service. His judgments and decrees were looked upon as final.

His medical reputation spread rapidly. It was in 1190 that Maimonides wrote to his favorite pupil Joseph b. Judah ibn Aknin in Aleppo that he had acquired great reputation in medicine among the nobility such as . . . the chief Kadi, the Emirs, the house of Al Fadil, and others. . . . Having become body physician of Saladin's Grand Vizier Al Fadil,[9] he was appointed through him, physician at the court of Saladin.[10] We shall refer later on to Maimonides' relations with members of the Sultan's family. His fame extended far beyond the confines of lower Egypt and he received a call to become physician of the "Frankish sovereign" in Ascalon; it is generally assumed that this was Richard Coeur de Lion; ("L," p. 287); Maimonides declined to go.[11]

His local fame has endured in a surprising manner. Dr. Meyerhof of Cairo whom we shall mention again in this address tells that to this day sick persons are carried to the Synagogue of Maimonides in Cairo to sleep there, in the hope of obtaining healing through the spirit of the great physician, just as was the custom of incubation in the ancient Temple of Aesculapius.[12]

It is interesting to note that the renowned traveler Benjamin of Tudela visited Cairo in 1167 within the earliest years of Maimo-

[9] Meyerhof gives the name as Abd ar Rahim ibn Ali al Baisani.

[10] Ibn Abi Usaibia is authority for the statement that Saladin held him in high esteem and appointed him as his personal physician.

[11] Meyerhof is of opinion that it was Amaury I of Jerusalem (Amalric). But he died in 1173 and that was before Maimonides has acquired fame in Medicine ("AA," p. 126).

[12] "Z," p. 136.

nides' residence there. He tells us that the number of Jewish inhabitants was seven thousand. He mentions Nethanel, the head of the Academy and the Grand Rabbi of Egypt, who is identified [13] with Hibet Allah ibn al Jami [14] who later became Saladin's physician.[15] But Benjamin makes no mention of Maimonides. We must assume that Maimonides' reputation was not yet established. We do not know the relations between Maimonides and Hibet Allah. With another Jewish physician of Egypt, Maimonides' relations were close, namely with Abul-Ma'Ali ibn Hibatallah al Yahudi [16] who succeeded Hibet Allah, as body physician of Saladin and who was, in all probability doubly his brother-in-law, the husband of Maimonides' sister and it was his sister who was the wife of Maimonides. If this assumption is correct, then it was his son whom we shall meet later as the editor of the Aphorisms of Maimonides.[17] Let me here mention another personal matter of importance.

Maimonides' only son, Abraham, who likewise became a physician and succeeded in his father's communal duties, was born in 1187 when Maimonides was 52. The son was but 17 when the father died. A melancholy line in one of Maimonides' letters (to ibn Aknin) informs us that there were but two things in which he still found pleasure, in study, and in watching the development of his son, who gave great promise.

It is not for me to deal with Maimonides' many activities in Egypt. Here we shall restrict ourselves to his medical practice and his medical writings. In his letter, written in 1199 to his friend and his translator, ibn Tibbon, he writes: [18]

"I dwell at Fostat and the Sultan resides at Cairo; these two places are two Sabbath days' journey (about one mile and a half) distant from each other. My duties to the Sultan are very heavy. I am obliged to visit him every day, early in the morning; and when

[13] By Zunz, Itinerary of Benjamin of Tudela, Adler ed. London, 1907.

[14] Meyerhof gives the name as Hibbat-Allah ibn Zein ad-Din with the surname ibn Djami al-Israili, "AA."

[15] Article 183, "A" and p. 432 "EE."

[16] Aboul Ma'ali ibn Tamman according to Meyerhof "AA."

[17] "GG," p. 52 and "EE," p. 433. According to Al Qifti, Abul Maali was secretary to the mother of Al Afdal who became Sultan.

[18] Adler, Epistle, etc.—"Miscellany of Hebrew Literature," London 1872, p. 219.

he or any of his children, or any of the inmates of his harem, are indisposed I dare not leave Cairo, but must spend the greater part of the day in the palace. It also frequently happens that one or two of the royal officers fall sick, and I must attend to them. Hence, as a rule, I repair to Cairo very early in the day, and even if nothing unusual happens, I do not return to Fostat until the afternoon. Then I am fatigued and hungry. I find the ante-chambers filled with people, both Jews and Gentiles, nobles and common people, judges and bailiffs, friends and foes—a mixed multitude, who await the time of my return.

"I dismount from my animal, wash my hands, and entreat my patients to bear with me while I partake of some food, the only meal I take in the twenty-four hours. Then I go forth to attend to my patients, write prescriptions and directions for their several ailments. Patients go in and out until nightfall, and sometimes even, I solemnly assure you, until two hours and more in the night. I converse with and prescribe for them while lying down from sheer fatigue, and when night falls I am so exhausted that I can scarcely speak.

"In consequence of this, none converse with me (on religious or communal matters) except on the Sabbath. On that day the whole congregation, or at least the majority of the members, come to me after the morning service, when I advise them as to the work of the whole week; we study together a little until noon, when they depart. Some of them return, and read with me after the afternoon service until evening prayers. In this manner I spend the days. I have here related to you only a part of what you would see if you were to visit me." It is difficult to understand how Maimonides was able to accomplish all he did in his less than forty years' sojourn in Egypt. His religious and philsophical writings alone would seem to have required a lifetime of undisturbed labor of a great intellectual genius. His medical practice as we have seen left him little spare time. And yet his medical writings were such as required vast studies,—reading the extensive translations of the Greek writers and of the prolix works of the Arabic authors, philosophical as well as medical. The extent of his knowledge is known by his references that cover the whole of Arabic medical literature and especially of

the vast collection of Galen's works. One can understand it only when he tells us that he never forgot anything.[19] It required such a mind with infallible memory and philosophic judgment to compose his "Aphorisms according to Galen." We might infer that Maimonides was very vigorous physically to perform so heavy a labor. But we learn that he suffered from poor health; he wrote to the Sultan "if already in my youth, how much more in my old age does it hinder me in service to my Lord." [20]

We do not know the nature of his ill health. The death of his brother caused a prolonged illness; [21] his excessive duties, communal, rabbinical, medical and literary were without doubt contributary factors. His was no easy life. In the introduction to a work which he finished in 1180 he wrote: "In times of persecution like the present people lack the equanimity to devote themselves to intricate studies. . . ." [22] In his latter years he was charged with apostasy from Islam and saved from its grave danger by his friend the Grand Vizier. In a letter he writes of the attacks that threatened his life. During his last years he suffered much from pains and weakness as we read in one of his letters. He lived through a period of plague and famine and earthquake in 1201 and 2.[23] During his last illness he was able to revise the "Aphorisms," with the exception of the last chapter. His nephew, abu-l-Ma'ali Yussuf ibn Abd Allah, who was his scribe, wrote a note in a manuscript copy that he transcribed the last chapter after Maimonides' death.[24] This took place on the 13th of December 1204. According to his desire, he was buried in Tiberias where, like many thousands, I have visited his grave.

In turning our attention to the medical activities of Maimonides, it should be stated that medicine was not his chief interest. Indeed he tells us this in a letter to Jonathan of Lunel: "Although from my boyhood the Torah, (i. e. the Bible and the whole of Talmudic and Rabbinic lore) were betrothed to me and continued to hold my

[19] "K," p. 6.
[20] "V," p. 5.
[21] Many years later he wrote "It is the heaviest evil that has befallen me. For a full year, I lay on my couch stricken with fever and despair." "FF," p. 66.
[22] Marx, Octocentennial Address, 1935.
[23] Abd al Latif, "Y," p. 623.
[24] "GG," p. 152.

heart as the wife of my youth, strange women whom I first took into my house as her handmaids became her rivals and absorb a portion of my time"; foremost among them was medicine.[25] He served her with devotion though her demands were heavy. Let us turn to another letter (to ibn Aknin in 1190) in which he writes: "for you know how tedious and how difficult is the art of medicine for him who is conscientious and faithful, and who is unwilling to state anything which he cannot support by evidence and without knowing upon whose authority it is given and how it can be proved (to be correct)."[26]

Let us now review briefly the medical writings of Maimonides. They appear to have been written in the latest period of his life. In these as in all his studies and writings, ardent in his pursuit of truth, he was governed by the following sanctions of validity: "Man should believe nothing which is not attested (1) by rational proof as in mathematical science, (2) by evidence of the senses or (3) by authority of prophets and saints." How earnestly Maimonides feels concerning this subject is seen in the following extract from the last chapter of the Aphorisms: "In this aphorism, it is my purpose to bring before you something well deserving your examination and belief: If anyone declares to you that he has actual proof, from his own experience, of something which he requires for the confirmation of his theory,—even though he be considered a man of great authority, truthfulness, earnest words and morality, yet, just because he is anxious for you to believe his theory, you should hesitate. Do not allow your mind to be swayed by the "novelties" which he tells you, but look well into his theory and his belief, just as you should do concerning the things which he declares that he has seen; look into the matter without letting yourself be persuaded easily.

"And this is true, whether the person in question is notable, or one of the people. For a strong will may lead a man to speak erringly—especially in disputation. I offer this foreword in order to awaken your interest in the statements of that wise man, that prince, Galen."

[25] "AA," p. 154. [26] "HH," p. 330.

Maimonides wrote all his medical works in Arabic; these were all translated into Hebrew; some were translated into Latin and these have special interest for us because they exerted greater influence upon European medicine. A few of the works have appeared in recent years in German translation, one, the work of Steinschneider, others of Kroner,[27] a few in other European languages but several works are still unavailable except in Arabic or Hebrew manuscripts.

The most important of the medical works is the "Aphorisms according to Galen." They are arranged in 25 chapters and number about 1500. In reading these works we must constantly bear in mind the period during which they were written and the state of medical knowledge of the time. The necessity of classification of diseases had found a satisfactory system at the hand of the Greeks in the theory of the four humors and the qualities, hot, cold, wet, and dry. Health was the harmony of the humors. This universal philosophy of living processes and of disease was accepted with devotion akin to that with which religion was embraced. The authority of the great Greek physicians was absolute and unquestioned, "yet it was an Arabic writer who first pointed out the imperfections of the Galenic anatomy." [28] Maimonides shared in the universal admiration of the great Greek physicians and especially of Galen whom he describes as pontifex and prince.

In these Aphorisms, we have a systematic presentation of the practice of medicine, under various headings. The purpose is stated

[27] "H," "N," "O," "P," "R," "U."

[28] Withington relates an interesting anecdote: "When the physician Abdallatif was in Egypt, the conversation turned one day upon the superiority of observation to mere reading; and some one remarked that there was a great heap of skeletons and dead bodies at Maks. So Abdallatif went there, and found a hill consisting rather of corpses than of earth, and with more than 20,000 skeletons exposed on the surface. The delighted physician proceeded to examine these, and at once noticed that the lower jaw consists of one bone, and not of two as described by Galen. He tells us that he examined 200 lower jaws in every possible way and got others to examine them also, both in his presence and absence, and they all came to the same conclusion. Similarly he observed that the sacrum is composed of a single bone, and he expresses his intention, "if Providence permits," of writing a book of revised anatomy comparing Galen with nature." (p. 172.) We shall have occasion to refer again to Abd-al-Latif.

clearly: "There are many things which the doctor must know and ever bear in memory, not all things of course . . . For no one's knowledge ever attains to the comprehension of everything, but compilations prepared in the form of aphorisms are understood and retained without difficulty . . . No compiler of aphorisms can include everything . . . I shall not say that I have compiled, I have rather selected . . . from the words of Galen, out of all his works." In addition, most chapters contain aphorisms which state Maimonides' own views or comments, beginning in the form common at that period with "Moses says." The volume in the Latin translation covers some 260 pages; is characterized by the brevity which Maimonides elsewhere commends.[29] The accuracy of his knowledge of Galen's statements is shown on every page but nowhere more clearly than in the contradictions or dubious statements to which he devotes the last chapter. When we consider the maze of Galenic literature we can easily understand how welcome such a work was to the practicing physician. In it, Maimonides shows the same amazing ability for which he is renowned, as a systematizer and codifier of Jewish law. We realize that its composition was only possible because of his comprehensive knowledge, his philosophic mind, and not least, his marvelous memory.

In one respect Maimonides made a change in the Aphorisms. In the "Yad ha-Hazaka" he gave no references to the sources, and vehement criticisms followed. Each paragraph in the "Aphorisms" is followed by reference to its source! It is quite possible that his earlier experience led Maimonides to do this. In the introduction to the Aphorisms, there is this significant statement: "And since I know that more men are ignorant than wise, and more men have ill-will than good-will, I have had the foresight to specify at the end of every aphorism, which 'particula' of Galen I am citing, etc."

The chapters are as follows: (1) Organs of the Human Body, (2) Humors, (3) Foundations and Methods of the Medical Art, (4) Pulses and their Signs, (5) Urines and their Signs, (6) Signs of Special Diseases, (7) Causes of Special Diseases, (8) Treat-

[29] "G." Maimonides said "if he had been able to put the whole of the law into one chapter, he would not have put it into two." (Marx.)

ments of Diseases Affecting the Whole Body, (9) Treatments of Diseases affecting Special Parts of the Body, (10) Fevers, (11) Periods and Crises of Diseases, (12) Purgation of the Body by Loss of Blood, (13) Purgation by Cathartics, (14) Purgation of the Body by Emetics, (15) Surgery, (16) Diseases of Women, (17) Rules of Health, (18) Exercise, (19) Bathing, (20) Food and Drink, (21) and (22) Materia Medica, (23) Definitions of Diseases and Medical Terms with Which Doctors are not Familiar, (24) Miraculous Things Found in Medical Works, (25) Dubious Sayings of Galen.

It would be useless to quote extensively from this work; it is a resumé in well-ordered form of Galen's teachings of medical practice. We understand why Honain ben Isaac's "Introduction to Medicine," the compendium on the theory of medicine, was often added to the Aphorisms. Together they formed the "Principles and Practice of Medicine."

What interests us most are the commentaries and additions of Maimonides. I shall give a few examples. The chapter on Humors affords special interest in that the idea of antagonistic principles in the humors and their combinations brings to mind its modern counterpart in the principles of vagotonia and sympathicotonia; and the interaction of the secretions of the ductless glands. We understand how a complete system of medical theory and medical practice was built up upon it. In this way, the medical scholar was enabled to classify the whole of medical knowledge and experience in a system which gave full satisfaction because it answered the requirements of logic and philosophy. How deeply it has influenced the modern mind is seen in the fact that we still use in our daily language the terms: the sanguine temper, the phlegmatic, the choleric and the melancholic.

In order to show the manner in which the theory was applied to the digestion, which term embraces the entire function of metabolism, let me cite the following aphorism: Maimonides says: "I have learned from the sayings of Galen . . . that the best urine from a sick person is that in which (presently) "laudable" (i. e. healthy) sediment appears; this urine stands first, because nature has perfectly accomplished her operation and will have digested the

materia morbi. Next to this in excellence is the urine which issues cloudy, and then becomes clear, having a laudable sediment; this signifies that nature has begun to work and her work will soon be perfectly accomplished,—this is the second. Ranking third in excellence is that which issues cloudy, afterwards becoming clear without any sediment; this signifies that nature has begun to work but that the stage of digestion has not yet been reached. Next to this comes the urine which issues cloudy and remains cloudy; this is further from the process of digestion than the preceding, and it is the fourth. After this comes that which issues thin and clear (subtilis), then becoming cloudy; this signifies that nature has not yet begun to work, but will begin shortly. And the very worst of all the urines is that which issues thin and remains thin; this signifies utter absence of digestion, at the present time and for the future." (Aphorisms, 1489 ed. p. 50.) Leaving aside the theory, our clinical friends may find the basis for these views on laudable sediment in their observations during recovery from acute infectious diseases and on the evil prognosis of thin clear urine in the late stages of the nephroses.

In dealing with the natural, animal and spiritual faculties Maimonides offers the criticism of older views: "Now I am acquainted with the words of the doctors who say that there is a spiritual animal virtue and a natural virtue . . . But I say on this matter that all the workings of the human body are corporeal actions. . . . And in what we have said, one thing is certain: that the loss or cessation of action is due to weakness of the universal 'animal virtue' (faculty) ruling the body, it is not due to the weakness of any individual organ whose function that action is." (Aphorisms pp. 65, 66.)

In another chapter, Maimonides criticizes Galen for failing to classify all the causes of syncope "though everything which he (Galen) says is quite true, it is unorganized" . . . "For only if one knows the causes of syncope, will one be able to recognize its onset and combat the cause." This is followed by a very detailed classification and description. (Aphorisms p. 67.)

Concerning certain diseases, Maimonides' observations are very interesting. Thus he tells us "Galen states that diabetes is rare and

that he has only seen it twice. Maimonides says: I, too, had not met with a case of this in the West nor have I ever heard any one of my old teachers say that he has ever seen it. Yet, here in Egypt I have seen several persons suffering from this disease, lasting from ten to more than twenty years. This signifies that the disease is more frequently generated in warm regions; sometimes it happens in the land of Egypt, because of the Nile water which the inhabitants drink." In another place he states that the number of cases of diabetes which he has observed was twenty men and three women. (Aphorisms p. 90 and p. 229.)

The subject of foods is given much attention and it is interesting to observe that Maimonides makes note of the remedial qualities of certain foods.

There are pages of remedies arranged according to their qualities; hot and cold; dry and moist, with the note that " it is the medicines in frequent and universal use that should be well understood." (Aphorisms, p. 193.)

In discussing a case of severe phthisis, described by Galen, the " dry condition " being treated by means of nothing but continued warming " and which " was brought to extreme dryness from lack of food and yet not fed." Galen stated " when the members are not nourished they soon become cold." Maimonides adds with fine sarcasm, these last words of Galen are sound. (Aphorisms p. 247.)

I am tempted to read Maimonides' remarks on what Galen says concerning the Greek language, which he declared suitable to human beings above all others, but time forbids.[80]

[80] Galen . . . said these very words: " The Greek tongue is sweeter, more delightful, more docile, more intelligible, and better adapted to human nature than all the other tongues. If you are familiar with the tongues of other peoples, you will recognize truly that one of them resembles the grunting of pigs; another the croaking of frogs; another the chattering of jackdaws, which appears disgraceful, produced, as it is, by a movement of the tongue, the lips and the whole mouth. For some persons, when they speak, often bring forth a sound from the inside of the body of the throat like unto the sound of snoring. Some twist their mouths with hisses; some bellow and shout with all their voice; some utter no sound at all; some open their mouth wide and stick out the tongue; some never open their mouth wide and their tongue seems slow to move as if it were weighed down and bound fast.

" Maimonides says: These are the words of Galen concerning the Greek tongue: which he declared suitable to human kind above all other tongues.

" It seems to me that what he has said about the Greek tongue is sound. For

Let me add but one more quotation:

"Moses speaks: We learn . . . that the soul is subject to health and disease, just as is the body. The health and disease of both . . . undoubtedly depend upon beliefs and customs, which are peculiar to mankind. Wherefore I call senseless beliefs and degenerate customs . . . diseases of humanity.

"Within the sum total of these diseases there is one which is widespread, and from which men rarely escape. This disease varies in degree in different men, just as all bodily . . . diseases vary . . . I refer to this: that every person thinks his mind . . . more clever and more learned than it is; . . .

"I have found that this disease has attacked many an intelligent person . . . who is well-versed in physical science, or mechanical art, or one of the positive sciences. And they . . . express themselves (not only) upon the science with which they are familiar, but upon other sciences (as well) about which they know nothing, or in which they are little versed; speaking . . . upon these sciences as if upon a science with which they were familiar. Especially is this apt to happen if met with applause from persons of distinction; then the speaker becomes master and leader and we have one more

the pronunciation of the elements (of speech) is in accordance with the nature of the different climes of the inhabitants, and the shape and size of their instruments of speech . . . Just as persons of a temperate climate are more perfect in feeling, in form, and in appearance; the composition of their members is better, and their constitution is better proportioned than is the case with persons in other climates that are located in extreme points, as the extreme north and the extreme south; so the pronunciation of the elements by these persons of the said temperate clime, and the movement of their instruments of speech when they talk, are more finely proportioned, and closer to the human language, than are the pronunciation of the elements and the movements of the instruments of speech, of the persons situated in an extreme climate, far removed from a temperate climate . . . The Greek tongue, the Arabic, the Hebrew, the Chaldaic and the Persian are similar to one another, being the tongues of persons living in temperate climes . . . Anyone who knows the Arabic tongue and the Hebrew, knows that the two are undoubtedly one. The Chaldaic tongue approaches them as closely as they approach each other. The Greek is close to the Chaldaic, though they differ slightly—that is, in three or four elements. The Persian is not close to the others, and likewise the pronunciation of the elements is quite different. And let not the speech of men who today are living in a temperate clime, yet speak disgracefully, let not this deceive you. For they have moved there from extreme points; and it is just as if a Hebrew, or an Arab, should be found in the north or the south, continuing to speak there the tongue on which he was raised in his own land." (Aphorisms p. 253.)

'great man.' He speaks; his words are heeded; no one opposes him. And . . . as his popularity increases . . . so likewise does the disease itself become aggravated." (Aphorisms p. 254.)

With this let us close our remarks about the "Aphorisms." Some estimate of the importance of this work in Europe may be made on the basis of the five editions in which it appeared between 1489 and 1579.[31] Tornamira (1329-1396) a professor at Montpellier called the work the "Flowers of Galen."[32] Amatus Lusitanus in 1553 in his discussion of the causes and effects of "black bile" refers to Maimonides as the first to determine certain facts later confirmed by the (school of) Ferrara.[33] We learn on good authority that Mercurialis (1530-1606) the distinguished professor of medicine in several Italian universities praised the Aphorisms of Maimonides as not inferior to those of Hippocrates. (Immanuel Aboab, Nomologia, Amsterdam 1629, pt. II, p. 275.)

Such writers as Zacutus Lusitanus (1575-1642) cite the Aphorisms frequently, and we find it quoted even as late as the end of the 18th century in a work on Ophthalmia.[34]

Maimonides also wrote a commentary on the Aphorisms of Hippocrates. No translation has been made into any European language. But Steinschneider published a translation of Maimonides' introduction.[35] After explaining his views of the purposes and scope

[31] Bologna, 1489; Venice, 1497; Venice, 1500; Venice, 1508; Basel, 1579 abbreviated ("an arbitrary elaboration," Sarton). Chapter 19 of the Aphorisms was published in the Colectio de Balneis, Venice, 1553. The library of the Jewish Theological Seminary, New York possesses a Hebrew manuscript containing chapters XV to end of work. Kahle has recently published a description of the Arabic text and furnished a translation of the introduction (See Schröder's "Galeni in Platonis Timaeum Commentarii Fragmenta," Leipzig, 1934, Appendix 2).

[32] Clarificatorium juvenum, Venice, 1507, see "J," p. 232.

[33] (Centuria iv, Cur. 42.)

[34] Trnka de Krzowitz, "Historia Ophthalmiae," Vienna 1783. The citation is sufficiently interesting to record; his quotation is not accurate; the original statement is: "A person who has never seen ophthalmia, when he sees a case will have his eyes become filled with fluid. If he continues to gaze upon it, he himself will be affected with ophthalmia." (Aphor. XXIV § 19.)

[35] "G." It is significant that in this introduction to a medical work he lays the same emphasis in almost the same words upon the distinction between commentaries and aphorisms as he does in his *Yad ha Hazaka* between commentaries and codes.

of commentaries in general and " recognizing that the Aphorisms of Hippocrates are the most useful of all his works, I resolved to explain them, for they should be known by heart . . . But some are of doubtful meaning,—some are erroneous . . . Galen explains them as it suits him. I shall explain them . . . following Galen in the main, but in the case of some aphorisms, according to my own views and over my own name. But I do not purpose to furnish a compend as I have elsewhere done, but a short commentary in brief sentences which can be easily memorized " . . . We must remember that books were very scarce in those days!

One of the most interesting and most popular of Maimonides' works, in the middle ages was on " Poisons and Antidotes." It was written at the request of the Grand Vizier al-Fadil in 1198. The Latin edition has not been printed. A French translation by Rabinowicz appeared in Paris in 1865. This work was translated into German by Steinschneider and published together with an exhaustive study of the Arabic writings on Toxicology in Virchow's Archiv.[86] The book is written in so scientific and independent a spirit, with such practical advice that one often feels in reading it that it is a modern work. We are not surprised to learn that writers like Mondeville and de Chauliac in the 13th and 14th centuries citing Maimonides as an authority, frequently quote from this work.[87] The book is divided into two parts and ten chapters. The first part deals with the following subjects:—Bites of snakes and other animals, the treatment in general of those who are bitten;—simple and compound remedies to be applied to the bite;—simple and compound remedies for snake bites;—special remedies for the bites of certain animals. The second part deals with the prophylaxis against various forms of poisoning. Maimonides divides poisons according to Galen into hot and cold, that is such which produce fever and psychic

[86] " H." A new German translation together with an edition of text, not accessible to Steinschneider was prepared by Kroner and the manuscript has come into the possession of the Boston Medical Library. It is to be hoped that this will soon be published, for it contains valuable additions to our knowledge. There are several Hebrew manuscript copies at the library of the Jewish Theological Seminary, New York. This German translation has been rendered into English by Bragman, Medical Record, July & Aug., 1926.

[87] " J."

excitement and those which produce cold and depression. In the first category, mild quietening remedies are in place; in poisoning of the second category wine and stimulants are useful. Typical for the action of the first form is the bite of the viper, the second that of the scorpion. Maimonides recommends keeping the bite wound open so as to allow the poison to escape. In order to prevent the poison from reaching more vital portions of the body, a ligature is to be tied around the limb above the bite.

Antidotes are divided into two classes; those acting through their chemical and physical qualities, useful only in special forms of poisoning and others which . . . possess specific and peculiar power; the latter class may be used in all forms of poisoning. The normal doses of antidotes given are for individuals above twenty years; younger ones from ten to twenty receive half the dose, and children under ten, one-fourth the normal dose. In general, temperament and environment, the intensity of the symptoms, the climate and the season of the year are to be considered. In winter and in cold countries, and according to the intensity of the symptoms, the dose is to be correspondingly increased.

If it is at all possible, the poison is to be sucked out of the wound; but not by anyone having sores in the mouth or carious teeth; the mouth and lips of the one who is to suck, are to be covered with olive oil in order to prevent his being poisoned. Cupping, scarification, and cauterization, are to be applied, when suitable, to get rid of the poison. As remedies for the pain and psychic excitement, internal and local measures are to be used. The description of rabies is excellent. "Symptoms do not generally appear until after eight days have passed, sometimes much later" . . . "All cases are to be treated for at least 40 days during which the wound is to be kept open!" There is reference to substances that irritate the kidney and the bladder, such as cantharides, poisonous mushrooms.

We may next take up the Regimen Sanitatis.[38] Withington,

[38] It was twice translated into Latin. The translation by Armengaud of Blaise is the "Tractatus Rabbi Moysi quem domino . . . Soldano Babilonia tranmisit," Florence 1477 (reprinted in facsimile, Heidelberg, 1931). The 1477 edition was the first medical book published in Florence. Subsequent editions Pavia 1501 and 1517, Venice 1514 and 1518, and 1521, Augsburg 1518, Lyon 1535. A German transla-

whose account of Arabic medicine shows great insight, writes that this "Book of Counsel . . . is of great interest and forms the earliest example of (this) form of literature" . . . The book was written for the Sultan al-Malik al-Afdal, eldest son of Saladin, during his short reign 1198-1200 C. E. The Sultan suffered from attacks of depression, melancholia, and digestive disturbances with constipation. Maimonides presents a very sensible, carefully prepared essay with sound advice, based upon the science of the day and his own personal experience. He prefers reliance on the powers of nature to drugs. The Regimen was made up of four chapters (1) on personal hygiene including diet, (2) on home remedies to be used in the absence of a physician, (3) on the treatment of the attacks from which the Sultan suffered, and (4) on general hygiene in which he discusses climate, occupation, location of dwellings, baths, sexual hygiene, use of wines, effect of heat and cold, habits of life, etc. It is the third chapter that is most interesting for it contains the advice of a philosopher-physician in dealing with a patient suffering from mental depression. Maimonides explains how the physical condition is influenced by the mental state; the clever physician therefore seeks to improve the mental condition, as his first duty. He follows with a talk on ethics and philosophy, the strength that they lend in our attitude to the evils that are met with in life; for they teach us the real values of things and of realities;—they enable us to understand that the richest possessions are in themselves trivial and worthless things, for all of us must die! Philosophers regard the good of the world as well as the evil, as imaginary. Maimonides shows that much that is regarded as a great blessing turns into a curse and many an evil into good. How often have we seen persons lose fortune and position and just because of this, secure strength of body and growth of soul and character, with length of life to draw nearer to God and His service. Thus one attains eternal happiness!

It is an extraordinary lesson given to the powerful Sultan by his Jewish physician.

tion by Winternitz was published in Vienna in 1843. In 1925 a critical edition of the Arabic texts with German translation was published by Kroner, Janus, vol. 27-29. Two Hebrew manuscript copies are in the library of the Jewish Theological Seminary, New York.

It must have been well received for at a later period Maimonides was again called upon. This was the occasion for the writing of the tract we shall next mention. It was prepared by Maimonides because he was too ill to be present at the consultation of the royal physicians, and received the report of the opinions expressed. Maimonides spoke his mind very freely in approval or condemnation of the advice given. The king was suffering from hemorrhoids in addition to his melancholia; Maimonides advised against any surgical interference except as a last resort.

He attributes failure of treatment to the continued use of the same drug. His advice concerning the treatment of hemorrhoids depends almost exclusively on regulation of the bowels, on regular and moderate gymnastics, on periodical baths, on blood-letting, and especially on diet. He avoided all drastic purgatives, gave stimulants, and endeavored to increase the appetite. It is encouraging to find that Maimonides recommended wine especially in the aged, though he forbade it to the young. Finally he advised a carefully laid out program of life for each day; namely, rising early, drinking mead, riding horseback short of fatigue, gradually increasing gymnastics, then taking food, especially young chicken and fruits as dessert, then being sung to sleep. After awakening, pleasant light reading, or stimulating conversation. For supper, wine, and a half hour later, a meat course, and again being put to sleep by music. On the days of the bath, gymnastics should be mild and the bath follow immediately; after the bath the patient should nap. In the summer, the Sultan should seek a cool climate and the food that he recommends most highly is barley broth.[89]

Maimonides wrote a special tract on Hemorrhoids. In this he emphasizes the importance of intestinal disturbances and constipation in the production of this aliment and especially the influence of regulated diet in its relief.

Quite naturally we find the explanations based upon the humoral

[89] This work is extant in Arabic and in Hebrew translation. A. Latin translation with the title "De causis accidentium etc." was published as an addition to the Regimen in the 1477 and later editions; in the first without the title. Kroner published the Arabic and Hebrew texts with a critical translation into German in Janus 1928, vol. XXXII, p. 12 under the title of "Der medicinische Schwanengesang der Maimonides."

theory, the condition being due to the excess of black bile, more rarely of blood and least often of phlegm. And the modus is that the blood,—when it contains too much black bile, becomes thick and cloudy, so that the organs reject it; and it flows from organ to organ until this cloudy mass sinks as a deposit in the lower part of the body, filling up and stretching the vessels about the anus, thus forming the hemorrhoids. When they bleed let nothing be done to stop this, for it prevents serious internal diseases from arising! Local application of various oils is recommended as well as of balsams, ointment of zinc oxide, leadwash and fumigations!

In perusing this work we lose the sense of reading mediaeval medicine,—for so much of it is in accord with modern practice.[40] There are still other works written by Maimonides. One is on Sexual Medicine and Hygiene.[41]

Another is a work on Asthma which was translated into Hebrew and into Latin. It has never been printed.

Finally, a work of Maimonides mentioned in an old Arabic bibliography but long lost was discovered recently in Constantinople by Dr. Meyerhof of Cairo. It bears the title "Explanation of Drugnames." Dr. Meyerhof writes to me as follows: "This is mentioned only by ibn Abi Usaibi'a and now I see that it is an authentic and forgotten work of Maimonides, although the Constantinople copy is from the very hand of Ibn al-Baitar, author of the greatest Arabic treatise of Pharmacology. I am delighted to have got this valuable document, which contains the names of drugs in five or six languages, especially in old Spanish. I made a preliminary translation but have still to revise it with the help of Arabic, Greek, Persian, Berber and Spanish scholars." A press announcement promises its publication about this time, the 800th anniversary celebration in Cairo.[42]

[40] This work was not available until 1911 when Kroner published the Arabic and Hebrew texts together with a German translation and a critical study. See "N," in bibliography. Bragman deals with this book in the New York State Medical Journal, June 1927.

[41] This has been published with the Arabic and Hebrew editions with German translation by Kroner. See bibliography "O" and "P." A Hebrew manuscript is in the library of the Jewish Theological Seminary, New York.

[42] No mention has been made of writings which have been ascribed to Maimonides

We have mentioned Maimonides' reference to obligations which religion places upon the practitioner of medicine. In a number of his works we find statements urging that the physician must ever be conscious of the high purpose of his profession, that only the properly educated and trained physician deserves the confidence of the patient. He condemns not only charlatanry but all physicians with superficial knowledge: "Medical practice is not knitting and weaving and the labor of the hands, but it must be inspired with soul and be filled with understanding and equipped with the gift of keen observation; these together with accurate scientific knowledge are the indispensible requisites for proficient medical practice." It is the duty of the physician to regard the patient not as a specimen to be placed into a particular class but as an individual, to consider his constitution, his emotional state, habits, physical strength, the immediate conditions, etc., and to avoid routine treatment. Maimonides bases this upon religion and ethics. But his conception of the relation of religion and medicine was much more profound. In his Commentary to the Mishna, his first great religious study, he sets forth that the healthy body is the necessary condition for a healthy soul and that from this point of view medicine serves a high purpose in the promotion of ethics and religion.[48] He looks upon the study of medicine as one of the choicest of religious activities and the means of education to the highest understanding and practice of ethics. ("X"). It was quite in line with Maimonides' attitude to religion that he condemned as sinful the use of sacred words and verses for performing cures, that he opposed with great vehemence all ideas of witchcraft and denounced the pretentions of astrology—and this he did four hundred years before Johannes Wierus wrote his works. The belief in astrology was general among Jews and

without warrant, nor to the socalled prayer of Maimonides which has definitely been shown to be of much later date; see Friedenwald, "The Ethics of the Practice of Medicine from the Jewish point of View," Johns Hopkins Hospital Bulletin, 1917, XXVII, p. 256.

[48] In one of his commentaries in which he discusses the supposed impropriety of having recourse to drugs for healing instead of seeking it by prayer, he expresses his opinion that just as a person who is hungry satisfies the hunger by eating bread and afterwards thanks God for it, so we are also in duty bound to offer thanks for the remedies which have been provided for human ills. ("K," 61.)

non-Jews. Certain rabbis in southern France addressed some questions to Maimonides concerning this subject. He informed them that "it was the first branch of secular learning he had seriously persued . . . He had reached the conclusion that the whole science of astrology was baseless foolishness! Toward the end of his letter he writes: "Let us never cast our reason back, our eyes are in front and not behind us." [44]

Maimonides was not only a philosopher and a physician but he was a philosopher in medicine and a physician in ethics and philosophy. There was complete synthesis. We are impressed by the emphasis that Maimonides lays on hygienic living, not in his medical works only but in his religious and ethical works as well. He does not regard Medicine as dealing with disease alone, but with Health and Disease, with stress on the former. He sees the force in Nature that is struggling to maintain and to restore health and in the Science and the Art of Medicine the effort to aid Nature. Maimonides therefore relied more on diet than on drugs; and on moderation in all things, even in the choice of medicines. We are informed that Maimonides' relations with his colleagues was cordial and that he always treated them with respect. We are fortunate in having records of the esteem in which Maimonides was held by contemporaries.[45] Abd al-Latif (1162-1231) of Bagdad visited Egypt to meet three scholars one of whom was Maimonides. He wrote: "Mousa ben Maimon visited me.[46] I recognized in him a man of highly superior merit, but full of ambition and the desire to court persons of power." As to the first part of this statement, it has been corroborated by all that we know; but as to the second, no writers nor any of the letters or the works of Maimonides give evidence to justify it.[47]

[44] "DD."

[45] Chwolson collected the references to Maimonides in Arabic literature and published them in translation in the "Literaturblatt des Orients." Leipzig, 1846, pp. 339, 342, 354, 375.

[46] Meyerhof gives the date as 1201 ("Y," p. 161). This was but three years before he died and Maimonides was ill at this time.

[47] His modesty is very apparent in his letter on astrology to the rabbis in southern France. "DD." "I am among the least of the scholars that Spain has produced. Whelmed with care, and exposed to frequent reverses through our dis-

Al Qifti (1172-1248) wrote that "Maimonides busied himself in Spain so industriously with the sciences that he completely mastered mathematics and medicine . . ."

Ibn Abi Usaibi'a (1203-1270) the great Arabic historian of Medicine served as physician at the hospital in Cairo where Abraham Maimonides was his colleague. He wrote of Maimonides that he was the most distinguished physician of his time both in the art and in the theory of medicine. He closes his biographical sketch with a poem by the poet Al-Said ibn Sina Almulk: [48]

"Galen's art heals only the body,
But abu-Imran's the body and the soul.
His knowledge made him the physician of the century.
He could cure with his wisdom the disease of ignorance.
If the moon would submit to his art,
He would free her from her spots at the time of full moon,
Would relieve her of her monthly ailments
And at the time of her conjunction, save her from waning."

No better summary has been given than that of Neuburger [49] "In his medical works, of which the Aphorisms, the writing upon Poisons and the Dietetic Epistle were much prized in the West, Maimonides shows himself an erudite and experienced physician, wholly free from mysticism, a soberly observant clinician who displayed in his therapeutics a decided preference for dietetic and expectant modes of treatment. In matters of theory he remained faithful to Galenism, but his intimate knowledge of its doctrines led him upon occasion to criticize the Pergamene." [50]

In Maimonides we find a man nurtured in Spain, on the scholar-

persion, I endeavored nevertheless to gather knowledge, like the gleaner working slowly behind the reapers." (Morais: Letter by Maimonides to Jews of South Arabia, Jewish Quarterly Review, 1935, Vol. XXV, p. 331.)

[48] Almulk is described by Abd al-Latif "a sage held in high esteem, a man of high achievement."

[49] History of Medicine, London, 1910, vol. I, p. 374.

[50] Graetz, though a great historian but not a student of medicine stated that Maimonides "was more a theoretic than a practical physician." This baseless statement has been repeated frequently by later writers. It has even crept into medical histories. "HH," p. 330.

ship and the culture of Islam and of the "Golden Age" of mediaeval Jewish history; he developed this scholarship and culture to the highest perfection. His was that rare universal mind which could embrace the whole of the science and philosophy of his period. In his intellect there was complete harmony of philosophy and religion, of science and ethics and medicine. This is the proof of his powerful intellect. His mind was wholly monistic; every phase of the universe, of matter and of spirit was coordinated in one divine creation. All things and all aspects of nature and of life, of thought and of action, were part of this harmonic whole. I shall not venture to answer the question whether this harmony made him the great man or whether he found that harmony because he was a great man.

BIBLIOGRAPHY

"A" — F. Wüstenfeld, Geschichte der arabischen Aerzte und Naturforscher, Goettingen, 1840, pp. 109-110.

"B" — L. Leclerc, Histoire de la médecine arabe, Paris, 1876, vol. II, pp. 57-64.

"C" — D. Campbell, Arabian Medicine, London, 1926, vol. I.

"D" — M. Steinschneider, Die hebraeischen Uebersetzungen des Mittelalters., Berlin, 1893, pp. 762-74.

"E" " " Die europaeischen Uebersetzungen aus dem Arabischen. *Sitzungsber. d. Kais. Ak. d. Wiss. in Wien*, vol. 151, Wien, 1905, p. 33.

"F" " " Die arabische Literatur der Juden, Frankfurt a. M., 1902, p. 199-221.

"G" " " Die Vorrede des Maimonides zu seinem Commentar über die Aphorismen des Hippokrates, *Zeitschr. d. Deutschen Morgenländ. Gesellsch.*, vol. 48, Leipzig, 1894, pp. 218-234.

"H" " " Gifte und ihre Heilung von Moses Maimonides, *Virchow's Archiv f. pathol. Anatomie*, vol. 57, 1873, pp. 62-109.

"I" " " Catalogus librorum hebraeorum in Bibliotheca Bodleiana, Berlin, 1852-60 (pp. 1861-1942.)

"J" — I. Pagel, Maimuni als medizinischer Schriftsteller. Moses ben Maimon, Leipzig, 1908, vol. I, pp. 231-247. Published by Gesellschaft zur Förderung der Wissenschaft des Judentums.

"K" — EPPENSTEIN, Lebens & Charakterbild, see Moses B. Maimon, published by Gesellschaft zur Förderung der Wissenschaft des Judentums, Leipzig, 1914, vol. II.

"L" — I. MUENZ, Moses ben Maimon (Maimonides). Frankfurt a. M., 1912, pp. 251-90.

"M" — S. MUNK, Notice sur Joseph ben-Iehouda . . . disciple de Maimonide. *Journal Asiatique*, Paris, 1843, no. 11, pp. 30-31.

"N" — H. KRONER, Die Haemorrhoiden in der Medizin des XII, und XIII Jahrhunderts, *Janus*, vol. 16, Haarlem, 1911, pp. 441-456, 654-718.

"O" " " Ein Beitrag zur Geschichte der Medizin des XII Jahrhunderts . . . Oberdorf-Bopfingen, 1906.

"P" " " Eine medicinische Maimonides-Handschrift aus Granada. In *Janus*, Leyden, 1916, pp. 203-247.

"Q" " " Die Sexualhygiene in der Medizin des Maimonides. *Monatschrift für Harnkrankheiten und sexuelle* Hygiene, vol. II, Stuttgart, 1928, pp. 133-7.

"R" " " Fi Tabir as-Sinhat. in *Janus* vol. 27, Leyden, 1923, pp. 101-116 and 286-300, vol. 28 (1924) pp. 61-74, 143-152, 199-217, 408-419, 455-472, and vol. 29 (1925) pp. 235-258.

"S" " " Die Seelenhygiene des Maimonides, Stuttgarter Ausstellung der Gesundheitspflege, Stuttgart 1914. (This has been in part rendered into English by Savitz, *Annals of Medical History*, 1932, vol. 4, p. 80.)

"T" " " Zur Terminologie der arabischen Medizin und zu ihrem zeitgenössischen hebräischen Ausdrucke. Berlin, 1921.

"U" " " Der medicinische Schwanengesang des Maimonides. Fi Bajan al-A'rad. *Janus* vol. 32, Leyden, 1928, pp. 12-116.

"V" " " Der Mediziner Maimonides in Kampfe mit dem Theologen. Oberdorf-Bopfingen, 1924.

"W" " " Maimonides als Hygieniker, in: Grunwald, Die Hygiene der Juden, pp. 243-261, Dresden, 1911.

"X" " " Arzt und Patient, in der Medizin d. Maimonides, *Ost & West*, vol. XII, 1912, p. 745.

"Y" — M. MEYERHOF, Zwei hygienisch-diätische Abhandlungen des Maimonides. "Der Morgen," vol. 4, Berlin, 1929, pp. 620-4.

"Z"—M. Meyerhof, L'Oeuvre médicale de Maimonide. *Archivio di Storia della Scienza*, vol. XI (1929), Rome, pp. 136-155.

"AA" " " Notes sur quelques médecins juifs égyptiens qui se sont illustrés à l'époque arabe—Reprinted from *Isis*, vol. XII, February 1929 (Belgium).

"BB"—L. Levy, Maimonide, Paris, 1911.

"CC"—Withington, Medical History from the Earliest Times, London, 1894.

"DD"—A. Marx, The Correspondence Between the Rabbis of Southern France and Maimonides about Astrology, *Hebrew Union College Annual*, vol. III, 1926.

"EE"—G. Sarton, Introduction to the History of Science, Baltimore, 1931. Vol. II.

"FF"—Yellin & Abrahams, Maimonides, Philadelphia, 1903.

"GG"—Kaufmann, Revue des Études Juives, vol. 7, 1883, p. 52.

"HH"—Graetz, Geschichte der Juden, vol. VI, Leipzig, 1871.

Note:

Since this address was delivered, two interesting publications have appeared, 1) Moses Maimonides, by Prof. Solomon Zeitlin, (New York, Bloch Publishing Co., 1935), and 2) an essay, Moses Maimonides, by Prof. Alexander Marx (Publication of Maimonides Octocentennial Committee, New York, 1935.) The writer has taken advantage of these to make a few biographical corrections.

EXHIBIT OF MAIMONIDES WORKS FROM THE LIBRARY OF HARRY FRIEDENWALD

Medical:

1. Aphorisms According to Galen, Bologna 1489, containing the Aphorisms of Honain.
2. Do. Venice, 1508, bound in with Aphorisms of Honain, 7 works of Hippocrates and Liber Zoar de Cura Lapidis.
3. Do. Basel, 1579.
1. Regimen Sanitatis, Florence, 1477, Facsimile reproduction, Heidelberg, 1931.
2. Do. part of Tabula Consiliorum of de Gradi, Pavia, 1501.

3. Do. Venice, 1514, by curious error of publisher's bookbinder, this is bound with the Super anima of Cajetanus of same publisher and same date.
4. Do. Augsburg, 1518.
5. Do. part of the Consilia Avicennae of de Gradi and tracts of Raymund Lulius, Blasius Astarius, etc., Lyon, 1535.

NON-MEDICAL:

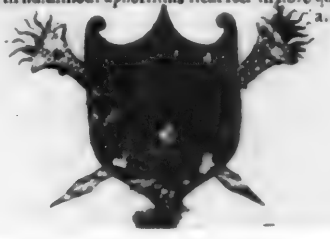
1. De Astrologia, Hebrew and Latin edited by Levita bound with Physica Hebraea, Cologne, 1555.
2. Doctor Perplexorum, translated by Buxdorf, Basel, 1629.
3. Liber de Idolatria, edition of Vossius, Hebrew and Latin, Amsterdam, 1642.
4. De Jure Pauperis de Peregini. Ed. of Prideaux. Hebrew and Latin, Oxford, 1679.
5. Theoremata de Principiis Juris Divini, Ed. by Vorstius, (Latin & Hebrew), Amsterdam, 1680.
6. Liber de Sacrificiis bound with Exordium of Abarbanel, London, 1683, Ed. by de Veil.
7. Opuscula Selecta (On the Building of the Temple and on Sacrifices) Edited by de Veil, Utrecht, 1713.

Prologus.

¶ Incipiunt aphorismi excellentissimi Raby Moyses secundum doctrinam Galieni medicorum principis.

IN nomie dei pii et misericordis cum quo adiuuo me Ait Moyses filius ferualli dei israelincus cordubesis multas cópilatões cópilauere multi sapientú uia aphorismorú in diuersis speciebus scientiarú et p ceteris scientiis hac uia indiget scientia metaphisice que licet non sit difficilis quo ad intellectú: sicut sunt multe scietie phisice. nec quo ad cognitóem subiectorú sicut sunt alique scientie ydiomatú pfectorú: est tamé difficillima quo ad multa que medicum oportet scire et in méoria semp habere. nec tamé omnia sed solum spéalia que i indiuiduis proxima sunt. ad omniú eni cóprehensionē sicut probatú est iam nó attingit scientia alicuius He autē cópilatónes uia aphoristica cópilate sunt facilis cognitóis et retentóis sine dubio. et ad sciendum et retinēdum materias necessarias suú aduuāt addiscentē. Et ob hanc cám ypocrates precipuus medicorú cópilauit suú librú diuulgatum de aphorismis. Et multi etiā alii medicorú cópilauerūt post eum tenentes eius uestigia aphorismos ut sunt aphorismi Rasis diuulgati et aphorismi Sufi. et aphorismi Iohannis Mesue Damascéni et aliorú. et est manifestum cuilibet prouidentú prouisione mānifesta qp quicúq; cópilator cópilauerit aphorismos in scientia aliqua non cópilauit eos uelut sufficiētes ad cóprehendendū omnes artis radices: sed velut valde utiles et sufficiētes pre ceteris cópilatóibus ad cóphendendum materias multas et diuersas necnó et ad eas in memoria retinēdum. Et in summa cópilator quicunque cópilauit aphorismos nó potuit p ipsos omnia que sunt necessaria sue scientie. Non ypocras in aphorismis suis nec ebnsſay alfarabii in omnibus his que cópilauit via aphorismorú nec alii qui minores illis fuere. Hec vero premisi ad exnsfationē horú aphorismorú quos protuli in pſenti libro eos cóformās. nec dico me compilasse sed elegisse: quia collegi eos ex verbis Galieni de óibus libris suis et ex eius verbis que dixit p viam cóplexionis in expositóe librorú ypocratis. Nec coarcto me in huiusmodi aphorismis sicut feci in libro qui bre/

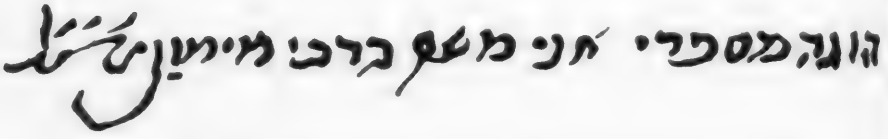
a.i.



First Page of the First Edition of the Aphorisms of Maimonides, Bologna, 1489

(From the copy in Dr. Friedenwald's collection)

The portrait of Maimonides reproduced on the first page, from Ugolini Thesaurus Antiquitatum Sacrarum, Venice, 1744, has become the conventional portrait of Maimonides. Its authenticity, however, is not established.



Autograph of Maimonides from the manuscript copy of his "Yad Hachazaka" in the Bodleian Library. The translation reads: "Revised from my book. I, Moses, the son of Maimon (the memory of the righteous is a blessing)".

MOSES MAIMONIDES, PHYSICIAN AND SCIENTIST

The William Osler of Medieval Arabic and Hebrew Medicine *

DAVID I. MACHT, M. D., Phar. D., Litt. D.

I am happy to have the privilege of addressing you on "Moses Maimonides, Physician and Scientist" because tonight I celebrate not only the octocentennial of this great philosopher, Hebrew scholar and physician but also a little anniversary of my own. Thirty years ago, December 11, 1905, when I was a senior student at the Johns Hopkins University School of Medicine, I read before the Johns Hopkins Hospital Historical Society my first contribution to medical literature, which was entitled "Moses Maimonides" and published afterward in the Johns Hopkins Hospital Bulletin. Today I welcome an opportunity to compare the impressions of Maimonides I held as a young man on the threshold of a medical and research career with those I hold after thirty years of continuous experience as a physician and as an experimental investigator in the field of medicine and allied sciences. The short time allowed me precludes any detailed discussion of Rambam's medical writings, which, I think, would be neither interesting nor profitable to the general public. I consider it more appropriate to discuss the position of Maimonides in the history of science and medicine in a general way and to point out his salient contributions as a physician, in the fullest sense of the word, to the progress of civilization and advancement of knowledge.

It is intrinsically true of science that it is ever going forward, changing and still advancing, always searching and researching for truth but only rarely reaching the absolute and fundamental. This very characteristic of science being always incomplete and ever looking forward to tomorrow is well expressed by the Hebrew term *da'ath,* which grammatically is the construct or incomplete

* Read at the Octocentennial memorial celebration of the birth of Maimonides, held by the Johns Hopkins Medical History Club and Osler Society on April 1, 1935.

form of *de'ah*. Many of the subjects which were discussed with so much fervor fifty years ago are almost forgotten now, and many an important discovery made today will probably be a platitude a year hence. For this reason, a complete estimate of the work of any scientist or medical man can only be made in relation to the age in which he lived, while a minute and detailed analysis of individual experimental and empirical data which he might have contributed are of interest chiefly to the specialist in any particular field of knowledge.

When studying the lives of great men in any field of endeavor, however, we usually discern certain trends of thought, philosophical attitudes, fundamental discoveries or methods of approach which we immediately recognize as new, original and marking milestones in the development of a particular department of science, art or other field of human endeavour and contributing significantly to the progress of civilization. Such fundamental contributions to the heritage of mankind are the earmarks of true genius and of genuine leaders in the arts, sciences and humanities. Another interesting feature noted on studying the lives of such great men is the impressive fact that, whereas science is essentially transitory and ephemeral or, at most, annual in character, the general emotions and fervor that animated our scientific predecessors, their love of truth and appreciation of its value, the stimulus of scientific imagination, and the hope of achievement for the benefit of fellowman that inspired them—whether eighty or eight hundred years ago—remain relatively unchanged; and they are worthy of emulation and reiteration in these troubled times when even science and the art of healing are no longer looked upon as universal and cosmopolitan and are tainted and distorted by prejudice and hatred, be it of race, creed or nationality.

Medicine is generally regarded as both a science and an art; and history tells us that Maimonides excelled in both of these. He was the leading scientist in medicine of his time and also the adept practitioner in the art of healing. His fame as physician or clinician is attested by the esteem of his contemporaries and posterity. Thus, the Arabic physician and historian, Osaibya, wrote of him that, " He, Abu Amram Musa ben Maimuni, was a man

deeply versed in the sciences and philosophy, who both in theoretical and practical medicine held the foremost place among the physicians of his time." The poet, Alsaid Ibn-Sina Almulk, wrote the following verses concerning him:

"Galen's art heals only the body,
But Abu Amram's (Maimonides') the body and soul;
With his wisdom he could heal the sickness of ignorance.
If the moon would but submit to his art,
He would deliver her of her spots at the time of full moon,
Cure her of the periodic defects,
And at the time of her conjunction save her from waning."

Furthermore, we know that by reason of his medical skill and erudition Maimonides became the special physician of Saladin, greatest of all the sultans. I am thrilled as much today as I was thirty years ago when I read that after the Crusade this renowned Jew was asked by Richard Coeur de Leon to desert his royal Saracen employer and go with him to England, which he declined to do. It is moreover interesting to learn that the illustrious prototype of the physician, Al Hakim, so vividly described by Sir Walter Scott in "The Talisman," is generally taken to have been Maimonides.

The duties of Maimonides as a physician were more strenuous than those of the modern practitioner and yet, like all great men, he found sufficient time with all his practice to devote to science, Hebrew lore, philosophy and the humanities, and to function as Chief Rabbi or *Nagid*. Many of us are quite familiar with the famous letter he wrote to one of his disciples, Juda Ibn Tibbon, a letter which became a classic in Hebrew literature and without which no estimate of Rambam can be adequate.

"Now, God knows that in order to write this to you I have escaped to a secluded spot, where people would not think to find me, sometimes leaning for support against the wall, sometimes lying down on account of my excessive weakness, for I have grown old and feeble. With respect to your wish to come here to me, I cannot but say how greatly your visit would delight me, for I truly long to communicate with you and would anticipate our

meeting with even greater joy than you. Yet I must advise you not to expose yourself to the perils of the voyage, for beyond seeing me and my doing all I could to honor you, you would not derive any advantage from your visit. Do not expect to be able to confer with me for even one hour either by day or by night; for the following is my daily occupation: I dwell in Mizr (Fostat) and the Sultan resides at Kahira; those two places are two Sabbath days' journeys (one and a half miles) distant from each other. My duties to the Sultan are very heavy. I am obliged to visit him every day, early in the morning; and when he, or any of his children, or any of the inmates of his harem are indisposed, I dare not quit Kahira but must stay during the greater part of the day in the palace. It also frequently happens that one or two of the officers fall sick and I must attend to their healing. Hence, as a rule, I repair to Kahira very early in the day and even if nothing unusual happens, I do not return to Mizr until the afternoon. Then I am almost dying with hunger. I find the antechambers filled with people, both Jews and Gentiles, nobles and common people, judges and bailiffs, friends and foes—a mixed multitude who await the time of my return. I dismount from my animal, wash my hands, go forth to my patients, and entreat them to bear with me while I partake of some light refreshment, the only meal I take in twenty-four hours. Then I go forth to attend to my patients, write prescriptions and directions for their several ailments. Patients go in and out until nightfall, and sometimes even, I solemnly assure you, until two hours and more in the night. I converse with them, and prescribe for them while lying down from sheer fatigue; and when night falls I am so exhausted that I can scarcely speak. In consequence of this, no Israelite can have any private interview with me except on Sabbath Day. On that day the whole congregation, or at least the majority, come unto me after the morning service, when I instruct them as to their proceedings during the whole week; we stay together a little until noon, when they depart. Some of them return and read with me after the afternoon service until evening prayers. In this manner I spend that day. I have here related to you only a part of what you would see if you were to visit me."

Turning now to the contributions of Maimonides as a medical scientist, we find a long list of writings dealing with a great variety of scientific subjects, and particularly with experimental and empirical clinical medicine. Inasmuch as it is impossible for any scholar to entirely separate his varied interests from each other, a great deal of valuable medical material, particularly of a hygienic character, may be found in both the theological and philosophical works of Maimonides. Thus, his great Mishna Torah, or "Code of Jewish Law," contains most interesting advice on hygiene, which is surprisingly modern in tone. Similarly, Maimonides' famous philosophical treatise, "Guide to the Perplexed," contains scattered references to medicine and other sciences. The bulk of Maimonides' contributions, however, are contained in his purely scientific works (written for the most part in Arabic), which number at least twenty and may be conveniently classified under five headings.

I. Expositions and commentaries on older authorities:
   1. *Pirque Mosheh* (aphorisms).
   2. Commentary on Hippocrates.
   3. Compend of Galen.
   4. Translation of Avicenna.

II. Works of a hygienic character:
   1. *De Regimine Sanitatis.*
   2. Notes on dietetics, written for Saladin's son.
   3. The ethics of Maimonides, which deals not only with conduct but also with general care of the body.
   4. Works on social and sex hygiene.

III. Works of a physiological and pharmacological character:
   1. Treatise on foods.
   2. Treatise on materia medica.
   3. *Sefer Hassamim,* or "Toxicology."

IV. Works on special subjects:
   1. Hemorrhoids.
   2. Gout.
   3. Asthma

4. Mental diseases.
5. Accidents and emergency treatment.

V. *De Causis et Indiciis Morborum,* or " Etiology and Pathology of Diseases."

The *Pirque Mosheh,* or *Fusūl Mūsā,* written between 1187 and 1190, is a collection of some fifteen hundred aphorisms (in twenty-five sections or chapters), taken largely from older writers, Hippocrates, Galen, Al-Razi, Avenzoar and others, but full of critical notes and additions or corrections by Rambam. Written originally in Arabic, it was translated into Hebrew and later into Latin, and deals with every phase of medicine—anatomy, physiology, pathology, clinical symptomatology, materia medica and therapeutics. Of the second group, the *Tadbir al-sihha,* or, in Latin, *De Regimine Sanitatis,* is a " Makrobiotik," or work on personal hygiene and dietetics, written about 1198 for *al-Malik al-Afdal,* Saladin's eldest son. Originally written in Arabic, it was translated and published in Hebrew in recent years in the periodical *Kerem Hemed* (III, 9-31).

Of the third group, the *Risālat al-fādilīyya* is perhaps the most important. In Hebrew, it is known as *Sefer Hassamim,* " Book of Poisons," or *Ha ma'amar Ha-nikbad.* This work on toxicology was written in 1199 and translated into various languages. The Latin translation, *De Venenis,* was used extensively by physicians in the fourteenth century. A German translation with notes by the late Dr. Steinschneider appeared in Virchow's Archiv (LVII). The sultan requested Maimonides to write this work on account of the numerous cases of poisoning, especially by poisonous animals, which were prevalent in his time. The work is extremely interesting to the modern pharmacologist and toxicologist because of the large amount of practical and useful information it contains. One section deals with bites of venomous insects and reptiles—scorpions, spiders, bees, wasps and snakes. Another section discusses bites inflicted by quadrupeds and by men. Here there is a long discussion of bites by mad dogs. The great length of the incubation period in rabies is emphasized. The importance of ligation and suction in treatment of poison wounds is also

stressed in this connection. "The first thing to do is to apply a tight band above the bitten part so as to prevent the poison gaining entrance to the body. While this is being done, an assistant should make incisions in and about the wound; and then, after rinsing one's mouth with oil, or with oil and wine, one should thoroughly suck the wound, being careful to spit out everything taken into the mouth. He who so sucks the wound should have no sore places in the mouth, nor any carious tooth. Should sucking be impossible, cupping may be resorted to." Another section deals with vegetable poisons such as opium, henbane and other Solanaceae, and toadstools. Still another describes such mineral poisons as verdigris, arsenic and litharge.

Of the fourth group, the treatise on accidents, written about 1200, and known in Hebrew as *Teshubot 'al she 'elot peratiyyot* and, in Latin, as *De Causis Accidentium,* is of special interest. It contains many prescriptions and formulae of other physicians, followed by some of his own, all of the latter being notable for their simplicity and medicinal value. In his work on asthma, *Maquāla-fi-l-rabw,* written about 1190, stress is laid on the importance of diet and climate for asthmatic patients. In the treatise on hemorrhoids, *Maquāla fi-l-bawāsīr,* we find a discussion which compares well with the most modern tests on the subject. Indigestion and constipation are stressed as etiological factors; diet is considered as of paramount importance in the treatment; and surgical manipulations are discussed.

Finally, in his great work, *De Causis et Indiciis Morborum,* or "Etiology and Pathology of Diseases," there is a comprehensive treatise on the "Science and Practice of Medicine," to which I shall refer later. From this work, as well as from his *Sefer Hassamim* or toxicology, we learn that Maimonides was centuries ahead of his time in his views on pharmacotherapy. He reveals a marked opposition to polypharmacy, or shotgun prescriptions (that is, complicated mixtures of obscure medicaments), and recommends only simple remedies and drugs which he had tested himself or the action of which had been established by recognized medical authorities. He was bitterly opposed to astrology and other occult arts in which the Arabs were so fond of dabbling. "The eyes look forward and

not backward," he writes in one of his letters. The use of amulets and incantations in medical treatment he considered a sin and an abomination. A quack he called a murderer. " In minor ailments," he wrote, " Nature cures the body without the need of medicinal remedies, if the patient only follows certain dietetic regulations. Where, however, the services of a physician are required, he should see to it that he aids Nature in her beneficial course. Most of the doctors err in their treatment. In endeavoring to assist Nature, they weaken the body with their prescriptions."

An examination of Maimonides' medical and scientific works reveals a number of important original conceptions with regard to medicine, in which he anticipated some of his colleagues by at least seven, if not eight, hundred years. In the first place, Maimonides, far in advance of his age, seems to have taken the modern attitude in regarding disease from the *etiological* or the causal standpoint, on the one hand, and to have stressed *pathological changes* produced by disease, on the other. It is regrettable that his most important work along this line, *De Causis et Indiciis Morborum,* has never been translated and is still lying in manuscript in the archives of Oxford and Paris. Concerning this work a famous medical writer, Alfred Nossig, has the following to say, " The very manner in which he undertakes his task in this his greatest work, the very fact that seven hundred years before the medicine of today, he already looks upon disease from the etiological point of view, his search for the *causes* of sickness—point to the man's keen intellect, and explain why he was regarded as such a great physician and rose to such fame."

In the second place, we find that Maimonides, in the most advanced spirit of the twentieth century, laid the greatest emphasis on hygiene and public health; in other words, on prevention of disease rather than its treatment. Throughout his works we find him stressing the importance of (1) dietetics, (2) proper balance between rest and physical exercise, (3) the value of fresh air, sunshine and salubrious climate, and (4) the inescapable and inseparable connection between morality and physical well-being.

In the third place, Maimonides, contrary to the custom of his times and the traditions of Hippocrates, Galen and other worthies,

champions simplicity in pharmacotherapy and recommends administration of simple prescriptions, as against polypharmacy or shotgun prescriptions, extensively employed not only by the ancients but also by many physicians even now. He repeatedly reiterates the paramount value of *Vis Medicatrix Naturae,* to such an extent indeed, that some historians have falsely accused him of therapeutic nihilism. In this connection, I again quote a few lines from one of his works. " Now, most physicians are greatly in error in that they think that medication strengthens the health; it weakens and perverts it; and for this reason hath Aristotle said that most of the patients who die, do so through the medicines of physicians. When the interference of the physician is indicated, his task should be (merely) to sustain the strength of the patient and to promote Nature in its effort at repair. Most physicians, however, err in their treatment. In endeavoring to assist Nature, they weaken the body with their prescriptions." The far-reaching significance of Rambam's views on etiology, pathology and therapeutics cannot be exaggerated. Perhaps we may appreciate them more if we recall that, as late as 1796, Dr. S. C. F. Hahnemann announced his doctrine of Homeopathics. This wizard promulgated the doctrine that all chronic diseases are derived directly or remotely from the itch and contended that it is possible to increase the potency of drugs by attenuating or diluting them all the way to the so-called thirtieth dilution or potency, which would be one drop of tincture in alcohol or water, sufficient " to envelop the terrestial globe, the planetary system, and all the stars of first and second magnitude." Need I add that even now such cults as osteopathy and chiropractic and so-called " Christian " Science and patent fakirs thrive in our midst and demand the most drastic legislation for protection of the public.

In the fourth place, one of the outstanding contributions of Maimonides to the history of medicine is his firm conviction and emphatic teaching regarding *mens sana in corpore sano,* or the cultivation of " a healthy mind in a healthy body." Rambam was one of the earliest physicians to recognize the importance of mental hygiene, and his work on psychotherapy is a classic in the history of medicine. This treatise constitutes one of the divisions of his *De Regimine Sanitatis,* or Makrobiotik, and is spoken of as " Hygiene

of the Soul." It was written for Saladin's son, who suffered from fits of melancholia. It gives psychotherapeutic advice and rules and what is especially remarkable, stresses the importance of dietetics in nervous and psychiatric affections and presents a complete dietary regimen for such cases. Maimonides regarded the body and mind as inseparable and mental hygiene just as important as that of the body. This view extended even to his exegesis of Biblical passages. Thus, for instance, in commenting upon " He that guardeth his mouth and tongue, keepeth his soul from distress " (Proverbs XXI, 23), he interprets the aphorism in both the physical and the spiritual sense: " He who taketh care of his food and drink, as well as of his speech (tongue), preserveth both his body and mind from distress." (The Hebrew word *nefesh* denotes both the *bios*, or physical, and the mental life.)

Maimonides' general attitude as a scientist may be best portrayed perhaps by a translation I made of one of his epistles to the Jews of Marseilles.

" Know, my lords, that man ought to believe only one of three things—firstly, something which he can clearly grasp through pure reason as, for instance, the science of arithmetic or geometry or astronomy; secondly, something which he can perceive with one of his five senses as, for instance, when he sees or tastes or hears or smells or touches; and, thirdly, something which he learns from the prophets and sages of blessed memory, that is, from trustworthy authorities.

" And every man, with common sense, ought to sift and classify, think about and reason over those things which he regards as true and those which he does not, and he should say unto himself, I believe this to be true because I perceive it through my senses, or I believe this to be true through pure reason; or I believe this to be true because I have been told so by the prophets and sages. He, however, who believes a thing which does not fall under any of these three categories, of him it is said, ' The simple believeth everything ' (Prov. XIV. 15).

" You should also bear in mind that there are fools who have compiled thousands of books, and that many ' great men '—great

in years but not in wisdom—have spent their days in the study of such, and these conceited creatures imagine that those books contain deep wisdom; and so their hearts become elated, and they imagine that they are great and wise because they have learned that wisdom, and it is just in this wherein most, if not all, the world is in error, with the exception of the few."

Unlike the natural scientists of the Victorian age who have smugly and complacently championed the mechanistic or deterministic view of universe and life to the exclusion of all that may be spiritual, Maimonides maintains that, while the scientist should always be guided by his perceptions and logical deductions and inductions, yet there are other things which may not be dreamed of in our philosophies. As Mr. Balfour said, " Science depends on measurement, and things not measurable by yardstick, chemical balance or other instruments of precision tend to be excluded from its attention. But life and beauty and happiness are not measurable; emotion and intuition and instinct are immensely older than Science and in a comprehensive survey of existence cannot be ignored. Scientists may rightly not consider them in order to do their experimental work but philosophers and physicians cannot."

R. L. Duffus, a modern critic and reviewer, has recently expressed the following thought, " The most civilized minds of our generation are those of scientists who have had the energy and the curiosity to master the humanities." Moses Maimonides undoubtedly belongs to the heroes of this class. His attitude as scientist and physician recalls a similar outlook on life held by another and much later scientist—that great genius of physics, and withal a real man—Michael Faraday, who found time to dedicate to both his oratory and laboratory, although he carefully kept the two apart. He was one of the first to champion and inculcate the doctrine that science and religion are not competitive but, on the contrary, complementary and supplementary; and it is only now, over seven hundred years since Maimonides' time, that scientists of foremost rank—Jeans, Eddington, Lodge, Millikan, Osborn, Jennings, Einstein and others—are coming to the same conclusion, that science and Torah must go hand in hand, study of Nature

and the humanities must advance together, or the whole structure of modern civilization is doomed and will crack up. Well may we in the spirit of Rambam take to heart the doctrine of Koheleth (Eccl. VII. 12), *W'yithron da'ath—ha'hakhmah t'hayeh baaleha,* which may be literally rendered thus:

> " The superior excellencey of science is—wisdom:
> 'Tis science taken wisely, science wisely pursued, wisely applied,
> That giveth life and maketh life the more worth while."

Those of us Baltimore medical men who have studied at the Johns Hopkins University will appreciate a striking parallel, which suggests itself to me, between the personality and attainments of Maimonides as physician and scientist and those of one who has contributed most to the fame of the Johns Hopkins Medical School and Hospital and of the City of Baltimore as a medical center—our beloved William Osler! Here are two men, standing eight hundred years apart, whose views on science, medicine and the humanities, whose attitudes toward the deeper problems of life and happiness of fellowmen had much in common. Both Maimonides and Osler combined a thirst for knowledge and love of science with a devotion to the practice of the healing art. Both Osler and Maimonides vehemently stressed the importance of etiology and pathology in studying disease. Both Osler and Rambam advocated simple rational medication to such an extent that they were sometimes styled pharmacologic nihilists, when in reality they were well acquainted with all there was to the materia medica of their times and, realizing acutely the lack of knowledge prevailing on the subject, chose only those simple medicaments the action of which was well established. Both Maimonides and Osler placed most of their reliance on the *Vis Medicatrix Naturae,* or Mother Nature, and believed that prophylaxis and hygiene were even more important than therapeutics. Both emphasized the importance of rest, exercise, fresh air, sunshine and diet. Both preached and practised sane morality and sex hygiene as foundations of healthy mind and body. Both Osler and Maimonides, far ahead of the majority of their contemporaries, saw the value of harmonizing science with the humanities. Well may we on this occasion con-

fer on Rambam the title of Sir William Osler of mediaeval Arabic and Hebrew medicine. In paying this tribute to his memory, it is only fair to state that he antedated Osler by some seven hundred years. In this connection, a citation from the Talmud (Sanhedrin 108a) may be apropos. In discussing the verse, "These are the generations of Noah; Noah was a righteous and perfect man in his generation; Noah walked with God" (Gen. VI. 1), the question was raised, What is meant by "in his generation?" Rabbi Yohanan answered that Noah was righteous when compared with the standards of his generation but not in comparison with those of later generations. Rabbi Resh Lakish, however, countered with, "If he was perfect in his degenerate times, how much greater would he have been in later generations!"

I deem it most fitting to conclude with the well known so-called prayer of Maimonides. I know full well that recently some have claimed that Rambam did not write this prayer. Who was the author of the prayer is quite irrelevant; the sentiments and lofty ideals it expresses have always been regarded as those of Maimonides. In these our days, when there are groups of creatures belonging to the genus homo (I dare not use the qualifying term *sapiens*) who, blinded by hatred, prejudice and superstition, reject the achievements of such physicians as Jenner, Koch, Virchow, Ehrlich, Neisser, Wassermann and von Behring because of their connection (real or fancied) with that great race which gave us the Rambam—I read a metrical translation which I composed thirty years ago, with heightened fervor:

"And now I turn unto my calling;
Oh, stand by me, my God, in this truly important task!
Grant me success! For—
Without Thy loving counsel and support,
Man can avail but naught.
Inspire me with true love for this my art
And for Thy cre-a-tures.
Oh, grant—
That neither greed for gain, nor thirst for fame, nor vain ambition,
May interfere with my activity.

For these, I know, are enemies of Truth and Love of men,
And might beguile one in profession
From furthering the welfare of Thy creatures.
Oh, strengthen me!
Grant energy unto both body and the soul,
That I may e'er unhindered ready be
To mitigate the woes,
Sustain and help,
The rich and poor, the good and bad, the enemy and friend.
Oh, let me e'er behold in the afflicted and the suffering,
Only the human being!"

ΠΕΡΙ ΓΥΝΑΙΚΕΙΩΝ Α′ OF THE CORPUS HIPPOCRATICUM IN A MEDIAEVAL TRANSLATION

(Cod. Leninopolitanus Lat. F. v. VI. 3, fol. 9)

GEORGE WALTER

Leningrad, Hermitage State Museum

Although the second book of this work has been known for some time in its mediaeval translation,[1] there has been until now no positive information as to a mediaeval Latin version of the *De Morbis mulierum liber primus*. The sole mention of a translation preserved in Naples, which I found in *Diels*,[2] is far too vague, and therefore it is impossible to ascertain how much of the entire work it contains.

Mediaeval translations of the Corpus Hippocraticum are, nevertheless, very important in the history of gynaecology, as Paul Diepgen has pointed out.[3] The very fact of their existence is in itself a discovery of great moment, since until that discovery they remained an unknown source in the continuity of the evolution through which gynaecology passed in European feudal society.

I hope, therefore, that the fragment of the *first* book, in a translation which I had the fortune to find on the much-damaged folio 9 of the Latin manuscript F. v. VI. 3 in Leningrad, in the Public State Library Saltykov-Štšedrin, will be favorably received, the more so because this manuscript seems to be dated not later than the beginning of the ninth century.

[1] This book was published by Walter Brütsch, *De diversis causis mulierum*. Inaug.-Dissertation, Freiburg i. Br., 1922, though without recognition of its content as hippocratic. The hippocratic content, assumed by Antonius Staerk, *La prononciation du grec en Occident au VIII^e siècle* (a French reprint of the Russian journal *Byzantijskij Vremennik*, XV) 1908, 2 n. 2, has been definitely established as the Pseudo-Hippocratic *second* book *de morbis mulierum* by George Walter, "Notice sur le contenu des parties médicales du ms. F. v. VI. 3" (*Analecta Medii Aevi*, II, Leningrad, Public-State-Library) 1927, 88 n. 1 (Russian with a French résumé) and also, independently of that, in extenso, but without discerning between the two books, attributed to this author, by Paul Diepgen, "Reste antiker Gynäkologie im frühen Mittelalter" (*Quellen u. Stud. z. Gesch. d. Naturwiss. u. d. Med.* III, *Hft.* 4) 1933, 19 sqq.

[2] H. Diels, "Die Handschriften der antiken Ärzte" (*Abhandl. d. K. Preuss. Akad. d. Wiss. Ph.-h. Cl.* 1905, Abh. III), 30; cfr. *ibid.*, 1906, Vorbemerkung, p. xv. There is mentioned the *Catal. Bibl. . . . mscr., quae in R. Neapolitano Museo Borbonico ads.*, 1827, by Janelli, which is not accessible to me.

[3] Diepgen, *o. c.*, 34.

The first book is represented there by the end of its 10th chapter (from line 20, according to the edition of the original by Ermerins, II, 544); chapter 11 is complete, followed by the first sentence of chapter 12 (as it is accounted at present — Ermerins, II, 548, 6),[4] but this last may perhaps have been considered in ancient times as the conclusion of the preceding chapter.

The responsibility for the relative state of corruption that has characterized this text until the present time, may be laid to copyists, who have committed there a number of omissions and successive alterations. It is evident that this translation, which in this way sometimes became incomprehensible, must at one time have followed the Greek text word for word, and have interpreted it more or less exactly, but at the same time the author's lack of literary education is manifest, pointing him out as a craftsman rather than as a scholar.

This author was undoubtedly not a Greek. It seems that even the construction *Genetivus absolutus* was unknown to him. We do not know in what part of the west he did work, but it is almost certain that his translation was copied in France. The faults of our manuscript: *saluaticas* (9 v° II 7 — according to the ancient French *salvage — sauvage*, instead of *silv-*) et *quodconque* (9 r° II 10 — cfr. the French *quelconque*) clearly testify to it. We are also led to this conclusion by the library of Saint-Germain-des Prés, where the manuscript was preserved until 1789, before that time belonging probably to the cloister of Corbie.[5]

[4] Here follows a prescription (v° II, 12-15), which did not belong to the primary text: *Suffumigatio ad eas qui ex nimio humores non concipiunt.* It is worth while noticing that its content corresponds to the subject of chapter 12, and thus it must probably be considered as a former marginal gloss. The page ends here with 14 blank lines, which induces us to admit the absence of a continuation in the text copied by the last scribe. For the *Incipit* of the second book *De morbis mulierum* has been preserved the beginning of the next page within the same quaternio.

[5] I do not think that the sojourn of the manuscript in Corbie is ascertained. When Brütsch, *o. c.*, 3, makes this assertion and Diepgen, *o. c.*, 18, says that it was even composed there, this is based on a misunderstanding of Gillert, "Latein. Handschr. in St. Petersburg" (*Neues Archiv d. Ges. f. ält. deutsch. Gesch.* V, 1879) 244-245, who has wrongly solved the question of the origin of another codex, closely connected with ours, and formerly bound together with it. For that matter, this codex is now the separate Leninopolitanus Lat. F. v. I. 12, containing the lives of some saints, which formerly, in *St. Germain-des-Prés*, was bound as fol. 1-106 to our medical manuscript. Gillert simply equalized all the manuscripts of Lenin-

It remains to note that our translation manifests in many places the closest relation to that of the Greek versions known as the *Vulgata*.

As regards the epoch in which this translation might be placed,

grad, quoted by him, *l. c.*, et seqq., belonging to Dubrovski's inheritance and acquired by the last in 1789 from St. Germain, with those which, numbering 400, were transported in the year 1638 to this cloister from Corbie. Gillert, *o. c.*, 243 n. 1, 245 n. 1, seems to rely on L. Delisle, "Le Cabinet d. manuscr. Bibl. Nat." (*Hist. gén. de Paris*), 1874, II, 53 sqq., cfr. 138, 141, but there such a conclusion is not to be found. So far O. Dobiaš-Roždestvenski, "Quelques inaperçus" (*Analecta medii aevi*, Leningrad, Public State Library, II, 1927, Russian), 41 sqq. (cfr. French résumé, p. 4, no. III), is correct when she disbelieves such categorical affirmations of Gillert, *o. c.*, and Staerk, *Les Manuscrits lat. . . . à la Biblioth. I. de St. Pétersb.* (St. Pétersbourg, 1910), I, 35, when she refers to the absence, in this manuscript, of superscriptions making allusion to Corbie, as well as of specific colours and handwriting-types, characteristic for its scriptorium. — These doubts are yet more suitable to our F. v. VI. 3, because the only extant indication in the second catalogue of Corbie, under no. 223, which mentions *medicinales quattuor* preserved at this cloister (*v.* Delisle, *o. c.*, II, 431), would not be sufficient for a definite identification of them with our codex. Therefore probably also Staerk *o. c.*, I, 42, rightly questions (in this case) the origin of F. v. VI. 3 from Corbie.

As for F. v. I. 12, I still believe that the sojourn at the library of Corbie is the most probable for it. The identical succession of six lives of saints, which compose nearly the whole content of this manuscript, as well as of no. 259 in the catalogue of Corbie dating from the 13th century (in Delisle, *o. c.*, II, 439), remains a striking fact. Its importance increases, if we remember the indubitable connections between Corbie, St. Germain and Leningrad in regard to the kernel of the Dubrovski's manuscript-treasure. And the more so, as F. v. I. 12 could find its place also in the more ancient catalogue of Corbie among the *viginti volumina* of the lives of saints (no. 308 in Delisle, *o. c.*, II, 432). No wonder then that the *Translatio sancti Nicolai*, which was formerly bound in the *first* place in this codex, has disappeared with time. There might also be various explanations as to the omission in the first mentioned catalogue of the epistle *Ferrandi Diaconi*. Therefore the hypothesis of Dobiaš-Roždestvenski, *l. c.*, on the ground of an inscription (*Sanctus dionisius qui tradente beato clemente (?) dirige me in ueritate tua et duco me quia tu es deus salutaris meus*) on fol. 106 v° of F. v. I. 12, seems not convincing. She dates the inscription from the 12th century (*o. c.*, 39), and, on the other hand, assumes that because in this manuscript are extant lives of some saints, even some of Paris, the codex probably originated and has been preserved in the cloister of Saint-Denis in Paris. The inscription mentioned could have been written anywhere, as an invocation to a personal saint. And the second argument is doubtful, because in this codex are collected lives of other saints as well, all of whom interested the monks, in the capital city and out of it. If, then, it remains probable that F. v. I. 12 was really preserved at the library of Corbie, so the same is at least possible for our F. v. VI. 3, which had already been bound together

it would not be more remote than the seventh century of our era, where, for example, Valentin Rose locates the Pseudo-Escolapius.[6]

The fact that this translation is verbal, and also that it contains at least two connecting chapters, makes it probable that we have to do here with a fragment of a translation, formerly more or less complete, of the whole book. This assumption is based on the position which this fragment occupies in our codex. It fills up the first page of the first quaternio,[7] and therefore its abrupt beginning, in the middle of a sentence, leads us to conclude that at least one quaternio formerly preceded those to be found in the codex as it is now.[8] There could have been about nine chapters which are now lacking.

Moreover, it should be observed that the second book of the same Hippocratic work, which was recently published by Walter Brütsch,[9] immediately follows ours — also in the Latin version. On the other hand, one might think that the loss of a definite number of beginning pages is quite possible, and would then come to the plausible supposition that our codex, consisting of a compilation of various, principally gynaecological, treatises, formerly began with the chief inheritance of this ancient science — namely, the Περὶ γυναικείων of the Corpus Hippocraticum, thus preserving this inheritance in its traditional arrangement.

It is certain, nevertheless, that the end of the first book did not find a place here,[10] perhaps merely because our codex obviously

with the first mentioned codex in St. Germain. This binding was probably not made by "enlightened" librarians of this cloister, but in olden times, i. e., possibly before 1638, in a time of decadence at Corbie.

[6] V. Rose, *Anecdota graeca et graecolatina* (Berlin, 1870), II, 177.

[7] The manner of stitching, which has set this quaternio in the second place in the present codex, is incorrect; *v.* G. Walter, "Zur Verfertigungsweise des medizin. Buches um 800 u. Z." (*Sudhoffs Archiv f. Gesch. d. Med. u. d. Natur.*, 27, 1934), 192, n. 2. It leads to the misconception that our fragment (Brütsch, *o. c.*, 4) was put in the third place, and in the work of Egert announced by Diepgen, *o. c.*, 18, n. 2, it will appear in the fourth place (cfr. *ibid.*, 19, no. 5). Just the fact that folio 9 of the present codex has for a long time been placed as the first exterior sheet of the codex, explains its extensive injury by water spots, which have made the text in some places completely unreadable, contrasting very noticeably with the good state of preservation of the other sheets.

[8] Cfr. G. Walter, *Notice sur le contenu etc.*, 80, n. 9 (finis).

[9] Cfr. *supra* my n. 1.

[10] Cfr. *supra* my n. 4 (finis).

represents only the final result of numerous stages of copying. In the same way the second Hippocratic book mentioned above has been preserved until the present time in the form of a fragment, though one of considerable size.

In publishing the text of the first book, which follows below, I have tried to reconstruct the text of the translator, because this is the most interesting for the history of mediaeval medicine. Therefore I have transferred the *lectiones*, which I consider wrong, to the commentary, with the designation: *Cod.* With regard to the parentheses, I use them in the following sense:

〈.....〉 illegible text, which I have reconstructed.
〈 〉 omissions in the text, which I have tried to complete.
[ ] foreign interpolations to be removed.
( ) my own additions and explanations.

〈 〉,

9r I 1 〈ụt〉ique [h]os eius (*scl.* matricis) curetur primitus // 〈ẹt〉 rẹctu*m* efficiatur; tunc laua// r〈ẹ〉 secundo *ue*l tercio (*scl.* die) debent matri// çẹ*m* et caput; et omnia qu〈a〉e humida sunt // delabentur. H〈a〉ec omnia hinc cognoscantur. //

5 (Cap. 11.) Qualis esse debet purgacio; quando contin// gent menstrua, pannu*m* subpositu*m* habeat // palmi magnitudine et sup*er*aspargis pullum cinerem, // ut sup*er* ipso decurrant menstrua; esse enim // debent duo panni cottidiani, unus p*er* diem, // alt*er* p*er* noctem; et qui inquanatur p*er* diem laua// 〈rị

10 dẹbẹ〉t alia die, similit*er* et ille qui de nocte // est, cum fuerit dies et nox, [tunc debentur // lauari panni]; et cognoscis in ipso lauacro, // 〈q〉uomodo ịll.....s, quali〈s〉 efficitur pan// -〈nus〉.....isos.... in loco sub abs// 〈condito〉..... ..... sicut // de mu〈co〉.....

15 .....〈co〉// lera, rubidus effịcịtur..... 〈c〉ọgnus// - ceris subtaniạ et..... me in// fert corpo〈r〉..... .....colorem et ae// tatem ẹt ui〈res〉.....〈ẹt qua〉lis dietas // utatur ..... ns corpo// res ob.... ..... in ipsut // .....

20 ....〈Quae autem〉 // habent (menstrua), nihil

II 1 iis fieri debet, 〈sed〉 quod uitio// sum est mens〈tru〉is, 〈 〉,

et quando sunt flegmatica et si//cuti membrana et colerica, uel putridinosa, *uel* //tenera < >, *uel* papi<l>losa adq*ue* nigra sicut carbones, *uel* //nebulosa et acria et salsa et turbulenta < >. Haec //ipsa<e> occasiones tollendae sunt (?), quia obstruunt //concipere matrice*m*. Quanta aute*m* phlegmati//ca et sicut membrana ostensa (?) ex mens//truis sunt et ips<a>e matrice<s> carnat<a>e sunt et // [h]os hum[a]ectu*m* habent et sputu*m* multu*m* et glutino //sum (?). Si acidum quodcumque accipiat mulier//cula <uel> acre, efficitur sputu*m* et rursum < > dela//bitur et omnia q*uae*cu*m*q*ue* comedant *ue*l pot//u*m* accipiant [ita fit, sicut dictu*m* est], iteru*m* //tollitur de superiorib*us* et inflat<ur> uenter //et angustia multa; [et] de capite rheuma descen//dit < > et m*u*lta humectatio (?) subsequitur et o//culi nigri efficiuntur et humidi (?). Has omnes (?)//<debes curare p*er* calefactiones [quod dicitur //<fomenta>re] et multoties prouocare ad uo//<mitu*m* et ci>b*us* no*n* dare, sed ieiunat; et [diutissime] //<mollire in>ferior uentrem et farmaca da//re omnia leuia < > et cibu*m* unu*m* et exercitare // < >, cibum uero siccum [non] dare et potus minus sed //merosu*m*; sed ad uentre*m* solutum facere melius est. Matrices *aute*m debemus, si non ad ista<m> di<a>eta<m> //<au>diu<nt>, purgare <pessa>riis quae no*n* morsu//ra <se (?)> praestant [q*uo*d e<st> pensus]. Et ante purga//cione*m* < > calefacere, prius calefaccione de foeniculo //et postea de thymiamatibus.

v° I 1 Sed si<c> calefac//cione<s> addere < >, ut omnia fiant < > ipso te*m*//pore qua*n*do sunt m<enstru>a. Et si munda < > et //sanguinea fuerint, sic ad uiru*m* suu*m* acce//dat, si secura est de menstruis suis, <quando ueniunt>, utilis//simu*m* est aut quando incipiunt minuere < >. // Sed quando concu*m*bere // habet cum uiro, utitor thymiamatibus //stypticis; f<um>igacio aute*m* sic est: canion, calamus // et carbones molles < > esse debe<n>t; et spargat //desup*er* farmacu*m* [quod iam dictu*m* est]; //quando aute*m* spargit farmacu*m*, canion //et calamu*m* tollat et sedeat et calefaci<a>t. Et // cum fumigatur (?), plumbo utatur, //sicut aperto ore fumigetur et cum se leuauerit, //in lecto iterum ponat ipsu*m*

plumbum; et < > //concumbat cum uiro et, dum concubuerit cum //uiro suo, conclusis femoribus at<que extensis> si-
15 lescat. // Et nihil utatur < > nisi farra [uel], ṣ<i ụẹlịt, ṣinẹ> //sale ex aqua; hoc faciat die < >. Qua<ṇdọ (autem) cọṇcụbụẹ>//rit cum uiro, [et] alia die si cognoue<ṛiṣ, qụọd ẹa> //semen tenuit neque altera (?) die (hoc) redi<ịt, ạbṣtịnẹạt>//cibis et balneis, bibat autem alphiton ex //aqua < >
20 bis (?) uel ter[cio] die. Ista autem di//<a>eta teneat<ur> diebus VI, melius autem, [si potest], //usque ad VII die<m> < >. Omni enim tempore < > mi//nus se debet mouere; et si delectetur am//bulare, in loco plano ambulet < >; neque [coṇ //labore] sedeat nisi in loca mollia; praeter[a]ea, //
v° II 1 quando concepit, omnem di<a>etam sic fa//ciat usque ad die<s> XXX. Et lauacro non //utatur < > neque satis calido; neque caput //infundat. Cibos autem excipiat os: //pane<m> < >, carne<m> palumbinam, pullina<m>, ma//rina autem
5 qu<a>e possunt uentrem stringe//re; uitare olera qu<a>e sunt acria; uino <nigro> //utatur, carnes uero assas melius est // quam coctas, et domesticas et silua//ticas.

(Cap. 12.) Haec debent fieri, quando con//cipiunt.

COMMENTARY

9 I 1 et *h. e.* ut *?* *2* lauare: *errore inducta translatio τοῦ δὲ καταπλύνεσθαι h. e.* si autem (genitura) lavetur. tercio *h. e.* -tio *hic et infra.* *3* debent (*scl.* curare)] decent *Cod.* *3-4* et omnia — delabentur: *corruptum genetivi absoluti translationis rursus falsae causa, h. e.* si autem (genitura) <computrescat et> delabatur, et <matrix et corpus> omne quod humidum est (curanda sunt). humida] fracida *Cod.* cognuscentur *Cod.* *5 γνώσῃ ὧδε ommissum quasi eiusdem (l. 4) sermonis iteratio.* contingent *h. e.* -unt*?* *6* subpositum *h. e.* complicatum *??* p. m.] de palmo *Cod.* *7* pullum] pollinacium *Cod., per* pullejaceum *corruptum ?* cignus *Cod.* decurrẹṇṭ *Cod.* *8* cottidiani: *interpretatio versionis vulgatae ἐφ' ἑκάτερα, v. ed. Ermerins II 544 nota ad l. 31.* *9-10* laua//.....ṛit *Cod.*: *rasura.* illum *Cod.* cum] sed dum *Cod.* fuerit *cfr. γένηται.* *11* nox et dies *Cod.* tunc — panni *corrupt. ex ἐπὶ τῇσι σποδιῇσι κειμένοισι ?* cognuscis *Cod.* *12* lauacro] panno *Cod.* *20-21 Hic (cod. l. 25-29) omnino, supra ex parte scriptum aquae (?) macula deletum.*

II 1 eos *Cod.* quod uitiosum] quam laboriosum *Cod.* < > *h. e.* id summovendum *translationis Ermerins II 545 n.* *2* sicuti membrana = *ὑμενώδεα ?* *4* sicut c.] *καὶ ἀνθρακώδεα.* agra *Cod.* *5* hoccansionis *Cod., ipse corr.* -es, *scl.* causae. *5-6* follendae s. q. o.] contingentque obstrupant *Cod.* Quanta] *Ὁκόσα vers.*

vulg. et ed. Littré, VIII 44. *6-7* fleumatica *Cod.* ostenduntur *Cod.* ex m.] *τῶν ἐπιμηνίων Vulg. et Littré.* *8* ipsae m.] *αὗται Vulg. et Littré qui, sicut Ermerins, hic feminas aegrotantes intelligi vult.* et] *sic et Vulg., om. ambae ed.* *9* glutinosum] blixidum *Cod.* *10* Si a. q. a. m.] sacitonicum quodconque accipiet muliertidas *Cod.* acer *Cod.* *11* rustrum *Cod.* < >] *ἄναλτον.* deḇabatur *Cod., ipse corr.* del —. *12* cummederent *Cod.* acciperent *Cod.* *12-13* ita f. s. dictum (*scl. l. 11*) e.] *corrupt. ὄχλος προίσταται h. e.* turbatio sequitur. tollitur d. s. *cfr. ναυσίη.* *14* rheuma d.] reoma discendit *Cod.* *15* humectus *Cod.* oculi n.] *ὑποφθάλμια πελιδνά conversa parum accurate.* *16* humidi (*false*)] *πεφυσημένα h. e.* inflati. haec omnia *Cod., Ταῦτας ὅλας ed. gr.* *16-17* calefaccionis *Cod.* multociens *Cod.* *18* et — ieiunat] *corrupt. καὶ ἀπὸ σιτίων καὶ ἀπὸ νηστείης h. e.* et a cibo et ieiunio. *19* uentris *Cod.* *20* et — unum *cfr. μονοσιτέειν.* cibus *Cod.* *21* sucus *Cod., cfr. ὡς ξηροτάτῃ h. e.* siccissimum. potum *Cod.* m. s. m.] *ἐλαχίστῳ ἀκρητεστέρῳ h. esset* (potum) minimum merosiorem. *22* s. (*cfr. εὔλυτος*) f.] solū (*et suprascripta*) tum facere *Cod.* matr⟨ic⟩is *Cod.* *24* qui *Cod.* morsuram *Cod.* pristant *Cod.* *25* p.] *h. e. glossa* pessus *?* *26 f.*] reniculo *Cod.*

v° I 1 timeamata *Cod.* *2* sunt] *cfr. εἴη Littré ex Vulg. et al.* *3* fuerent *Cod., cfr. γίνηται Vulg., Ermerins.* *5* minuere *uel* quando ueniunt *Cod.* *5-6* concū *Cod.* utetur timiamata stiptica *Cod.* *7* c. *h. e. κάνειον* (*Vulg., Littré*) *transcriptum*] canna *Cod., corrupt. per* caniū. calamū *Cod.* *7-8* c. m.] *cfr. σποδιήν h. e.* cinerem *!?* 10 canna *Cod., cfr. l.* 7 t.] *περιθεῖναι h. e.* circumponat. *11* c. f.] post quod fumauerat et *Cod.* plumbum *Cod., cfr.* uti *c. Accus. l. 6.* sed *Cod.* *11-12* f.] sumitur *Cod.* c.] dum *Cod.* iterum] uadat et *Cod., corrupt. per* it et. *13* et < >] *εἶτα ὑφελομένη αὐτίκα h. e.* deinde subtracto statim. cumconbat *Cod.* *13-14* dum — suo] *corrupta obscuritatis causa ἢν τὰ ἀπὸ τοῦ ἀνδρὸς μὴ ὀῆλά οἱ ᾖ h. e.* si semen viri ei non exsiliat, *cfr. Littré.* c. f. a. (ad *Cod.*)] *ἐκτείνασα τὰ σκέλεα καὶ ἐπαλλάξασα.* *14-15* seleṇçiąt *Cod.* farres *Cod., cfr. κυκεῶνα.* 16 et *Cod., cfr. l. 19.* faciat] *ποιέειν Ermer. ex codd., πιέειν Vulg., Littré.* *17* a. d.] *sicut Littré ex codd. omn.* *18* n. a. d.] *uel* die die *Cod.* *19* cibus *Cod.* alfida *Cod.*, h. e. *ἄλφιτον.* *20* b.] sicuta (*h. erat* sequenti *aut* secunda) *Cod.* *22* omne *Cod.* m.] *h. e.* minime *?* *23* si] sic *Cod.* d.] *cfr. βούληται.* *24* loco *Cod., cfr. ἐπὶ μαλθακά Littré ex codd.* praeterea — *v° II 1* faciat *conversio parum accurata.*

v° II 1 diētam *Cod.* *2* < >] *ἢ καὶ, ὅτε δέοι, λουθῆναι ὀλίγῳ h. e.* uel, si opus fuerit, pauco lauetur. s.] *cfr. λίην.* calidum *Cod.* *3* cibus *Cod.* *4* palumbine *Cod.* pull.] *cfr. καὶ τοῖσι παραπλησίοισι h. e.* et similia *!* *6* agra *Cod.* *uinū Cod.* cenes *Cod., h. debet esse* carnibus *etc.* *7* saluaticas *Cod., καὶ τῶν θηρείων Vulg. et Littré.* *8* d. f.] *χρὴ ποιέειν Vulg. Sequuntur spuria* (*cod. l. 12-15*): Suffumigątio ad eas qui ex ni//mio humores non concipiunt //puleio ac⟨ęrą⟩ yrius mittis et suffu//mica, *ex quibus pagina uacat.*

THE CORRESPONDENCE OF MAX VON PETTENKOFER

There are two kinds of people. There are people who preserve every letter written to them, every document concerning them, every scrap of paper. And they not only preserve them but keep them in good order. These are the scrap-book and diary types of men. The historians like them.

But there are also people who are absolutely careless with their belongings, who keep no records whatever, who destroy or lose or mislay their letters. They give the historians a hard time.

Pettenkofer (1818-1901), the great chemist, epidemiologist and founder of experimental hygiene in Munich, undoubtedly belonged to the first category, and after his death his papers were given to the Department of Hygiene of the University of Munich.

It is an astounding collection. The earliest document goes as far back as 1802, a contract of Pettenkofer's father when he purchased a farm. The latest documents are two drafts of letters to the Nobel Committee in Stockholm, in Pettenkofer's own writing, proposing Carl von Voit for the Nobel prize in physiology, Röntgen for the Nobel prize in physics. They are dated January 19, 1901. A letter of the Nobel Committee follows on the 24th of January, stating that Röntgen is receiving serious consideration. And the last document is a letter of condolence from the Epidemiological Society of London to Pettenkofer's family, written on March 23rd. On February 10th, Pettenkofer had ended his life.

A century is covered in this collection, and it was a century that meant much to medicine. A family folder contains school reports and certificates of the various men with whom Pettenkofer worked —Scherer in Würzburg, Liebig in Giessen, Fuchs and von Gietl in Munich. Poems of Pettenkofer are preserved, some of which were published in 1886, forty years after they were written, under the title, " Chemische Sonette," and the many diplomas bestowed upon him.

The bulk of the collection, however, consists of the correspondence, many thousands of letters, mostly those written to Petten-

kofer, but quite a few of his own letters, and a great many drafts of letters. He apparently was a conscientious writer who made a draft before he wrote the letter. And besides, he was not writing about trifles. The ever-recurring motives in the correspondence are cholera and the Institute of Hygiene. Reports were sent to him whenever cholera occurred in any part of the globe, and whenever a department of hygiene was organized, his advice was sought.

All nations are represented among the correspondents, great names—Wunderlich, Griesinger, Liebig, Virchow, Klebs, Flügge, Pfeiffer, in Germany, to mention only a few. In England the most assiduous correspondents were Macpherson, Rolleston, Simon, Lindley, and Cunningham, who wrote from Calcutta. Japan is represented by Ogata, Nakahama and others. Erisman and Boubnoff in Russia had a profound veneration for the old master.

There are only a few Americans among the correspondents; Harris in New York, C. B. White in New Orleans, Winkler an army surgeon, Brush a former student of Pettenkofer. Two letters of John Billings are preserved, one dated September 8, 1882, in which he thanks for a report on the Institute of Hygiene in Munich, hoping that a similar institution would be established soon in America. In another letter, of July 3, 1888, Billings expresses his gratitude for Pettenkofer's criticism of the cholera committee, and passes a rather severe judgment on Robert Koch. The reason why the American correspondents are not more numerous apparently is that the American students soon got under the spell of Koch, and therefore became most interested in bacteriology.

The present director of the Institute of Hygiene in Munich, Prof. Kisskalt, had the excellent idea of making this invaluable collection available for historical research. With the support of the city of Munich, he had a complete catalogue of all the documents made by Mr. Wolfgang Hessler. The letters are not only listed chronologically, but analyzed, a brief statement of their content being given in each case. An alphabetical index of the correspondents would have been convenient, but even without this the catalogue is an important instrument of research that will be most welcome to all those who are interested in the life and

work of Pettenkofer and his contemporaries, and in the public health developments at large.

Through the courtesy of Prof. Kisskalt, two copies of this catalogue were presented to our Institute, where I keep them at the disposal of my American colleagues.

HENRY E. SIGERIST.

MEDICO-HISTORICAL ACTIVITIES IN THE UNITED STATES

BALTIMORE, MARYLAND

JOHNS HOPKINS UNIVERSITY

Institute of the History of Medicine

On May 2 a students' exhibit illustrating the history of physiology was opened. An illustrated catalogue is being prepared, and will appear in a later issue of the Bulletin.

On May 7, Dr. Sigerist attended the 11th Annual Meeting of the American Association of the History of Medicine, and gave an address on Tarantism.

On May 13, Miss Lida Lee Tall visited the Institute with a group of students of the Maryland State Normal School. Addresses were delivered by Dr. Oliver and Dr. Sigerist.

The Johns Hopkins Medical History Club

The last meeting of the year was held on April 29. Dr. Henry R. Viets read a paper on Domenico Cotugno (1736-1822) and his Researches on the Cerebrospinal Fluid. Dr. Sigerist discussed some recent acquisitions of the Institute, and Dr. Temkin commented on the students' exhibit on the history of physiology.

Dr. Viets' collection of the works of Domenico Cotugno was exhibited in the Great Hall.

Last year's officers of the Club were re-elected.

H. E. S.

CHARLESTON, SOUTH CAROLINA

A letter from Dr. Joseph I. Waring, addressed to Dr. Oliver, gives the following details about the *Medical History Club* of Charleston:

"The Club was founded November 5, 1925 at the instigation of Dr. Robert Wilson, Dean of the Medical School here, and has been in continuous existence since. It has always been a very informal club, with no officers except the Secretary, no regular meeting place, and no dues. Meetings are held monthly except during the summer, and the members take turns entertaining the Club at their homes. The program is arranged as follows — The host of the evening acts as Chairman. Occasional business is transacted. The paper of the evening is read by the essayist and the other members in turn are called upon for such

discussion as they care to give. The Club then adjourns to a buffet supper.

"Through an unfortunate accident our early minutes have been lost, temporarily we trust, and I cannot give you a very accurate history. The membership of the Club is very changeable, as men drop out without formal resignation or others express a desire to attend the meetings. The average attendance is about fifteen.

"The papers presented have covered various subjects of general and local interest. They have had such titles as Greek Medicine; Pre-Vesalian Anatomy; Moral Evolution of Homosexuality; Life of Sydenham; History of Version; Tonsils, Historically Considered; Cotton Mather and Inoculation; Early History of Pharmacy in South Carolina; Early Physiologists of Charleston; Yellow Fever in Charleston; History of Roper Hospital; Medicine in Charleston before 1750; St. Philip's Hospital in Charleston; Henry Woodward; David Ramsay; John Lining; Alexander Garden; Francis Kinloch Huger; Thomas Dale; etc. etc."

JOSEPH IOOR WARING